

Q1. The Gram-positive cocci that grow in clusters are:

- A. Streptococcus
- B. Staphylococcus
- C. Enterococcus
- D. Neisseria

Correct Answer: B. Staphylococcus

Explanation: Staphylococci appear in grape-like clusters on Gram stain, unlike streptococci (chains).

Q2. Catalase test differentiates:

- A. Staphylococci from Streptococci
- B. Gram-positive from Gram-negative bacteria
- C. Bacilli from cocci
- D. Anaerobes from aerobes

Correct Answer: A. Staphylococci from Streptococci

Explanation: Staphylococci are catalase-positive; streptococci are catalase-negative.

Q3. Which bacteria are acid-fast?

- A. Escherichia coli
- B. Klebsiella
- C. Mycobacterium tuberculosis
- D. Treponema pallidum

Correct Answer: C. Mycobacterium tuberculosis

Explanation: Mycobacteria resist decolorization due to high mycolic acid content in cell walls.

Q4. Which of the following bacteria is oxidase positive?

- A. Escherichia coli
- B. Pseudomonas aeruginosa
- C. Streptococcus pneumoniae
- D. Klebsiella pneumoniae

Correct Answer: B. Pseudomonas aeruginosa

Explanation: Pseudomonas is oxidase-positive and produces a characteristic fruity odor.

Q5. Atypical pneumonia is most commonly caused by:

- A. Streptococcus pneumoniae
- B. Haemophilus influenzae
- C. Mycoplasma pneumoniae
- D. Legionella

Correct Answer: C. Mycoplasma pneumoniae

Explanation: Mycoplasma lacks a cell wall and causes interstitial, "walking" pneumonia.

Q6. The causative agent of syphilis is:

- A. Treponema pallidum
- B. Borrelia burgdorferi
- C. Leptospira interrogans
- D. Rickettsia prowazekii

Correct Answer: A. Treponema pallidum

Explanation: A spirochete that cannot be cultured in vitro; diagnosed with serology.

Q7. Which virus has a "dumbbell-shaped" core?

- A. Rabies virus
- B. HIV
- C. Poxvirus

D. Herpes virus

Correct Answer: C. Poxvirus

Explanation: Poxviruses are large, DNA viruses with unique dumbbell-shaped cores.

Q8. Which of the following bacteria produces spores?

A. *Neisseria gonorrhoeae*

B. *Escherichia coli*

C. *Bacillus anthracis*

D. *Staphylococcus aureus*

Correct Answer: C. Bacillus anthracis

Explanation: *Bacillus* and *Clostridium* are spore-forming Gram-positive rods.

Q9. Tetanus toxin acts by:

A. Inhibiting acetylcholine release

B. Blocking GABA release

C. Damaging neuromuscular junctions

D. Enhancing sodium influx

Correct Answer: B. Blocking GABA release

Explanation: Tetanospasmin blocks inhibitory neurotransmitters → muscle rigidity and spasms.

Q10. Which virus is associated with Burkitt lymphoma?

A. Hepatitis B

B. Epstein-Barr virus

C. Cytomegalovirus

D. Human herpesvirus 6

Correct Answer: B. Epstein-Barr virus

Explanation: EBV infects B cells and is linked to Burkitt lymphoma and nasopharyngeal carcinoma.

Q11. The most common cause of neonatal meningitis is:

A. *Streptococcus pneumoniae*

B. *Listeria monocytogenes*

C. *Escherichia coli*

D. *Neisseria meningitidis*

Correct Answer: C. Escherichia coli

Explanation: Along with group B streptococci, *E. coli* is a leading neonatal CNS pathogen.

Q12. Which of the following is a dimorphic fungus?

A. *Candida albicans*

B. *Aspergillus fumigatus*

C. *Cryptococcus neoformans*

D. *Histoplasma capsulatum*

Correct Answer: D. Histoplasma capsulatum

Explanation: Dimorphic fungi grow as mold at 25°C and yeast at 37°C.

Q13. Which parasite causes perianal itching in children?

A. *Ascaris lumbricoides*

B. *Enterobius vermicularis*

C. *Trichuris trichiura*

D. *Taenia saginata*

Correct Answer: B. Enterobius vermicularis

Explanation: Also called pinworm; diagnosed using the cellophane tape test.

Q14. Cholera toxin acts by:

A. Activating guanylate cyclase

- B. Blocking chloride channels
- C. Inhibiting adenylate cyclase
- D. Activating adenylate cyclase

Correct Answer: D. Activating adenylate cyclase

Explanation: Increases cAMP → chloride and water secretion → watery diarrhea.

Q15. Which virus causes hydrophobia and encephalitis?

- A. Rabies virus
- B. Polio virus
- C. Measles virus
- D. Influenza virus

Correct Answer: A. Rabies virus

Explanation: Rabies affects CNS; hydrophobia is due to pharyngeal spasms during swallowing.

Q16. Which of the following is NOT transmitted via the fecal–oral route?

- A. Hepatitis A
- B. Hepatitis B
- C. Poliovirus
- D. Rotavirus

Correct Answer: B. Hepatitis B

Explanation: HBV is transmitted via blood and body fluids.

Q17. Gram–negative diplococci in a urethral smear suggest:

- A. *Treponema pallidum*
- B. *Neisseria gonorrhoeae*
- C. *Escherichia coli*
- D. *Haemophilus ducreyi*

Correct Answer: B. *Neisseria gonorrhoeae*

Explanation: Appears as intracellular diplococci within neutrophils.

Q18. The vector of *Leishmania donovani* is:

- A. Mosquito
- B. Tsetse fly
- C. Sandfly
- D. Housefly

Correct Answer: C. Sandfly

Explanation: Female phlebotomine sandflies transmit *Leishmania*.

Q19. The most common cause of urinary tract infection is:

- A. *Proteus mirabilis*
- B. *Pseudomonas aeruginosa*
- C. *Klebsiella pneumoniae*
- D. *Escherichia coli*

Correct Answer: D. *Escherichia coli*

Explanation: Uropathogenic *E. coli* possess P fimbriae aiding adhesion to uroepithelium.

Q20. A “safety pin” appearance on Gram stain is seen in:

- A. *Vibrio cholerae*
- B. *Yersinia pestis*
- C. *Salmonella typhi*
- D. *Shigella dysenteriae*

Correct Answer: B. *Yersinia pestis*

Explanation: Bipolar staining gives a classic “safety pin” look.

Q21. A capsulated yeast causing meningitis in immunocompromised patients is:

- A. *Candida albicans*
- B. *Cryptococcus neoformans*
- C. *Aspergillus fumigatus*
- D. *Mucor*

Correct Answer: B. *Cryptococcus neoformans*

Explanation: Diagnosed with India ink stain and cryptococcal antigen testing.

Q22. Hepatitis C virus belongs to which family?

- A. Picornavirus
- B. Hepadnavirus
- C. Flavivirus
- D. Reovirus

Correct Answer: C. Flavivirus

Explanation: Like Dengue and Yellow Fever viruses, HCV is an enveloped RNA virus.

Q23. Which of the following bacteria is urease-positive?

- A. *Escherichia coli*
- B. *Pseudomonas*
- C. *Proteus mirabilis*
- D. *Salmonella*

Correct Answer: C. *Proteus mirabilis*

Explanation: Urease hydrolyzes urea → ammonia, leading to alkaline urine and stone formation.

Q24. The Schick test is used for:

- A. Tuberculosis
- B. Typhoid
- C. Diphtheria
- D. Tetanus

Correct Answer: C. Diphtheria

Explanation: Assesses immunity to diphtheria toxin; positive test = susceptible.

Q25. The bacterial structure responsible for motility is:

- A. Capsule
- B. Pilus
- C. Flagella
- D. Endospore

 **Correct Answer: C. Flagella**

 **Explanation:** Flagella are whip-like structures used for locomotion.

Q26. Which of the following fungi is known for causing “fungus ball” in lung cavities?

- A. *Candida albicans*
- B. *Cryptococcus neoformans*
- C. *Aspergillus fumigatus*
- D. *Histoplasma capsulatum*

Correct Answer: C. *Aspergillus fumigatus*

Explanation: *Aspergillus* forms mycetomas ("fungus balls") in pre-existing lung cavities (e.g., TB).

Q27. Which bacterium is associated with “rice-water stools”?

- A. *Shigella dysenteriae*
- B. *Vibrio cholerae*
- C. *Escherichia coli*
- D. *Campylobacter jejuni*

Correct Answer: B. *Vibrio cholerae*

Explanation: Cholera toxin causes profuse watery diarrhea due to cAMP-mediated chloride secretion.

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Q28. Which bacteria are most commonly associated with dental caries?

- A. *Streptococcus pyogenes*
- B. *Streptococcus mutans*
- C. *Streptococcus pneumoniae*
- D. *Staphylococcus epidermidis*

Correct Answer: B. *Streptococcus mutans*

Explanation: Produces dextran from sucrose, aiding adherence to teeth and acid production.

Q29. The causative agent of Q fever is:

- A. *Coxiella burnetii*
- B. *Rickettsia prowazekii*
- C. *Bartonella henselae*
- D. *Ehrlichia chaffeensis*

Correct Answer: A. *Coxiella burnetii*

Explanation: *Coxiella* is an obligate intracellular organism spread via aerosols from animal products.

Q30. Which organism produces a "double zone" of hemolysis on blood agar?

- A. *Clostridium difficile*
- B. *Clostridium tetani*
- C. *Clostridium perfringens*
- D. *Clostridium botulinum*

Correct Answer: C. *Clostridium perfringens*

Explanation: Produces alpha and theta toxins causing double hemolysis.

Q31. Which of the following is the most common cause of viral gastroenteritis in children?

- A. Adenovirus
- B. Rotavirus
- C. Norovirus
- D. Enterovirus

Correct Answer: B. Rotavirus

Explanation: Major cause of severe diarrhea in children under 5 worldwide.

Q32. Sabouraud's dextrose agar is used for culturing:

- A. Bacteria
- B. Parasites
- C. Fungi
- D. Mycobacteria

Correct Answer: C. Fungi

Explanation: Sabouraud agar supports fungal growth due to its acidic pH.

Q33. A flask-shaped ulcer in the colon is characteristic of:

- A. *Giardia lamblia*
- B. *Entamoeba histolytica*
- C. *Shigella* spp.
- D. *Salmonella* spp.

Correct Answer: B. *Entamoeba histolytica*

Explanation: Causes amoebic dysentery and typical flask-shaped ulcers on histology.

Q34. Negri bodies in brain tissue are pathognomonic for:

- A. Poliovirus
- B. Rabies virus
- C. Measles virus

D. Herpes simplex virus

Correct Answer: B. Rabies virus

Explanation: Eosinophilic intracytoplasmic inclusions seen in hippocampus or Purkinje cells.

Q35. The causative agent of whooping cough is:

A. Haemophilus influenzae

B. Bordetella pertussis

C. Corynebacterium diphtheriae

D. Streptococcus pyogenes

Correct Answer: B. Bordetella pertussis

Explanation: Produces pertussis toxin and causes paroxysmal coughing in children.

Q36. The vector for transmission of plague is:

A. Sandfly

B. Mosquito

C. Tick

D. Flea

Correct Answer: D. Flea

Explanation: Yersinia pestis is transmitted by rat fleas.

Q37. Which bacteria are urease-positive and associated with gastric ulcers?

A. Salmonella typhi

B. Helicobacter pylori

C. Campylobacter jejuni

D. Shigella flexneri

Correct Answer: B. Helicobacter pylori

Explanation: H. pylori survives acidic pH by urease activity, linked to peptic ulcers and gastric cancer.

Q38. Which hepatitis virus is a DNA virus?

A. HAV

B. HBV

C. HCV

D. HEV

Correct Answer: B. HBV

Explanation: Hepatitis B is the only DNA virus among hepatitis viruses.

Q39. Which of the following parasites causes hydatid cysts in humans?

A. Taenia solium

B. Echinococcus granulosus

C. Enterobius vermicularis

D. Giardia lamblia

Correct Answer: B. Echinococcus granulosus

Explanation: Causes cystic lesions in liver/lungs; spread via dog feces.

Q40. Which bacterial structure is responsible for antigenic variation in Neisseria gonorrhoeae?

A. Capsule

B. Pili

C. Flagella

D. Endotoxin

Correct Answer: B. Pili

Explanation: Pili undergo antigenic variation, helping evasion of host immune system.

Q41. A patient with a cat bite develops cellulitis. The most likely organism is:

A. Bartonella henselae

B. Streptococcus pyogenes

C. Pasteurella multocida

D. Brucella

Correct Answer: C. Pasteurella multocida

Explanation: Gram-negative coccobacillus from animal bites, sensitive to penicillin.

Q42. Which virus causes “slapped cheek” appearance in children?

A. Parvovirus B19

B. Measles virus

C. Coxsackie virus

D. Rubella virus

Correct Answer: A. Parvovirus B19

Explanation: Causes erythema infectiosum (fifth disease) in children.

Q43. The most common cause of community-acquired pneumonia in adults:

A. Klebsiella pneumoniae

B. Mycoplasma pneumoniae

C. Streptococcus pneumoniae

D. Legionella pneumophila

Correct Answer: C. Streptococcus pneumoniae

Explanation: Gram-positive lancet-shaped diplococci; alpha-hemolytic on blood agar.

Q44. The causative agent of chancroid is:

A. Treponema pallidum

B. Haemophilus ducreyi

C. Chlamydia trachomatis

D. Klebsiella granulomatis

Correct Answer: B. Haemophilus ducreyi

Explanation: Causes painful genital ulcers and inguinal lymphadenopathy.

Q45. Which parasite causes cysts in the brain and seizures?

A. Taenia saginata

B. Plasmodium falciparum

C. Taenia solium (neurocysticercosis)

D. Entamoeba histolytica

Correct Answer: C. Taenia solium

Explanation: Larvae form cysts in CNS → seizures, hydrocephalus.

Q46. Which fungal infection is commonly associated with diabetic ketoacidosis?

A. Aspergillus

B. Candida

C. Mucor

D. Cryptococcus

Correct Answer: C. Mucor

Explanation: Causes rhinocerebral mucormycosis in immunocompromised and diabetics.

Q47. The causative agent of kala-azar is:

A. Trypanosoma brucei

B. Plasmodium vivax

C. Leishmania donovani

D. Toxoplasma gondii

Correct Answer: C. Leishmania donovani

Explanation: Causes visceral leishmaniasis → fever, hepatosplenomegaly, pancytopenia.

Q48. Which virus is associated with congenital rubella syndrome?

- A. CMV
- B. Rubella
- C. Herpes simplex
- D. Varicella

Correct Answer: B. Rubella

Explanation: Triad includes cataracts, deafness, and PDA if infected during first trimester.

Q49. Which of the following is most associated with nosocomial infections?

- A. Streptococcus pyogenes
- B. Escherichia coli
- C. Pseudomonas aeruginosa
- D. Treponema pallidum

Correct Answer: C. Pseudomonas aeruginosa

Explanation: Common in ICU settings; causes ventilator pneumonia, catheter-related infections.

Q50. Which one of the following is a slow virus disease?

- A. Influenza
- B. Creutzfeldt–Jakob disease
- C. Measles
- D. Rabies

Correct Answer: B. Creutzfeldt–Jakob disease

Explanation: Caused by prions; progressive and fatal neurodegenerative condition.

Q1. Which of the following is the mechanism of action of penicillin?

- A. Inhibition of cell wall synthesis
- B. Inhibition of protein synthesis
- C. Disruption of DNA synthesis
- D. Inhibition of folic acid synthesis

Correct Answer: A. Inhibition of cell wall synthesis

Explanation: Penicillins inhibit bacterial cell wall synthesis by targeting penicillin-binding proteins (PBPs).

Q2. Which drug is a selective serotonin reuptake inhibitor (SSRI)?

- A. Amitriptyline
- B. Sertraline
- C. Phenelzine
- D. Imipramine

Correct Answer: B. Sertraline

Explanation: SSRIs like sertraline selectively inhibit the reuptake of serotonin, increasing its availability in the synaptic cleft.

Q3. Which of the following is a common side effect of ACE inhibitors?

- A. Hyperkalemia
- B. Hypoglycemia
- C. Tachycardia
- D. Weight gain

Correct Answer: A. Hyperkalemia

Explanation: ACE inhibitors can decrease aldosterone secretion, leading to retention of potassium, resulting in hyperkalemia.

Q4. The antidote for acetaminophen poisoning is:

- A. Vitamin K
- B. Naloxone
- C. N-acetylcysteine
- D. Flumazenil

Correct Answer: C. N-acetylcysteine

Explanation: N-acetylcysteine replenishes glutathione stores, preventing liver damage in acetaminophen toxicity.

Q5. Which of the following drugs is used for the treatment of epilepsy by inhibiting sodium channels?

- A. Diazepam
- B. Carbamazepine
- C. Phenytoin
- D. Both B and C

Correct Answer: D. Both B and C

Explanation: Carbamazepine and phenytoin inhibit sodium channels, stabilizing neuronal membranes and preventing seizures.

Q6. Which of the following is an anticholinergic drug?

- A. Atropine
- B. Salbutamol
- C. Metoprolol
- D. Nifedipine

Correct Answer: A. Atropine

Explanation: Atropine is an anticholinergic agent that blocks acetylcholine at muscarinic receptors, used

in bradycardia and organophosphate poisoning.

Q7. Which of the following is a common side effect of metformin?

- A. Hyperglycemia
- B. Diarrhea
- C. Weight gain
- D. Hypokalemia

Correct Answer: B. Diarrhea

Explanation: Metformin, a first-line agent for Type 2 diabetes, commonly causes gastrointestinal upset like diarrhea.

Q8. What is the mechanism of action of beta-blockers?

- A. Inhibition of calcium channels
- B. Blocking the action of catecholamines at beta-receptors
- C. Inhibition of prostaglandin synthesis
- D. Inhibition of renin release

Correct Answer: B. Blocking the action of catecholamines at beta-receptors

Explanation: Beta-blockers inhibit the effects of epinephrine and norepinephrine at beta-adrenergic receptors, decreasing heart rate and blood pressure.

Q9. Which of the following is a first-line treatment for hypertension in pregnancy?

- A. Lisinopril
- B. Methyldopa
- C. Amlodipine
- D. Furosemide

Correct Answer: B. Methyldopa

Explanation: Methyldopa is a central alpha-2 agonist considered safe for hypertension in pregnancy.

Q10. Which of the following medications should be avoided in patients with gout?

- A. Ibuprofen
- B. Aspirin
- C. Allopurinol
- D. Prednisolone

Correct Answer: B. Aspirin

Explanation: Aspirin inhibits uric acid excretion, worsening gout attacks.

Q11. Which of the following is the primary action of aspirin?

- A. Antiplatelet
- B. Antihypertensive
- C. Analgesic
- D. Antipyretic

Correct Answer: A. Antiplatelet

Explanation: Aspirin irreversibly inhibits COX-1, reducing thromboxane A2 and preventing platelet aggregation.

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Q12. Which of the following is an opioid antagonist?

- A. Fentanyl
- B. Morphine
- C. Naloxone
- D. Buprenorphine

Correct Answer: C. Naloxone

Explanation: Naloxone reverses opioid effects by competing for opioid receptor binding.

Q13. Which of the following is a contraindication for the use of NSAIDs?

- A. Asthma
- B. Peptic ulcer disease
- C. Hypertension
- D. Hyperkalemia

Correct Answer: B. Peptic ulcer disease

Explanation: NSAIDs inhibit COX-1, reducing prostaglandins, and increase the risk of gastric ulcers.

Q14. Which of the following drugs is an aldosterone antagonist?

- A. Spironolactone
- B. Furosemide
- C. Lisinopril
- D. Hydrochlorothiazide

Correct Answer: A. Spironolactone

Explanation: Spironolactone blocks aldosterone receptors, preventing sodium retention and potassium loss.

Q15. Which of the following is a calcium channel blocker used for hypertension?

- A. Diltiazem
- B. Metoprolol
- C. Lisinopril
- D. Spironolactone

Correct Answer: A. Diltiazem

Explanation: Diltiazem is a non-dihydropyridine calcium channel blocker that reduces heart rate and blood pressure.

Q16. Which of the following is a characteristic of digoxin toxicity?

- A. Hyperkalemia
- B. Hypokalemia
- C. Hypercalcemia
- D. Hypocalcemia

Correct Answer: B. Hypokalemia

Explanation: Digoxin toxicity is exacerbated by hypokalemia and can lead to arrhythmias.

Q17. Which of the following is an inhaled corticosteroid used for asthma?

- A. Salmeterol
- B. Prednisolone
- C. Fluticasone
- D. Montelukast

Correct Answer: C. Fluticasone

Explanation: Fluticasone is an inhaled corticosteroid used for long-term control of asthma.

Q18. The mechanism of action of benzodiazepines is:

- A. Blockage of dopamine receptors
- B. Enhancement of GABA action
- C. Inhibition of serotonin reuptake
- D. Inhibition of NMDA receptors

Correct Answer: B. Enhancement of GABA action

Explanation: Benzodiazepines increase the effect of GABA at the GABA-A receptor, leading to CNS depression.

Q19. Which of the following is used to treat acute glaucoma?

- A. Latanoprost
- B. Timolol
- C. Acetazolamide

D. Prednisolone

Correct Answer: C. Acetazolamide

Explanation: Acetazolamide is a carbonic anhydrase inhibitor used to reduce aqueous humor production in acute glaucoma.

Q20. Which of the following is a major side effect of long-term corticosteroid therapy?

A. Hypoglycemia

B. Osteoporosis

C. Hypotension

D. Hyperkalemia

Correct Answer: B. Osteoporosis

Explanation: Corticosteroids cause bone demineralization, leading to osteoporosis with long-term use.

Q21. Which of the following is an irreversible non-selective COX inhibitor?

A. Ibuprofen

B. Naproxen

C. Aspirin

D. Celecoxib

Correct Answer: C. Aspirin

Explanation: Aspirin irreversibly inhibits both COX-1 and COX-2, leading to antiplatelet effects.

Q22. Which drug is a selective β_1 -blocker?

A. Propranolol

B. Atenolol

C. Carvedilol

D. Nadolol

Correct Answer: B. Atenolol

Explanation: Atenolol selectively blocks β_1 receptors, minimizing bronchoconstriction.

Q23. Which drug is a loop diuretic?

A. Hydrochlorothiazide

B. Furosemide

C. Spironolactone

D. Mannitol

Correct Answer: B. Furosemide

Explanation: Furosemide inhibits the $\text{Na}^+-\text{K}^+-2\text{Cl}^-$ symporter in the thick ascending limb.

Q24. Drug of choice for anaphylaxis:

A. Hydrocortisone

B. Chlorpheniramine

C. Epinephrine

D. Ranitidine

Correct Answer: C. Epinephrine

Explanation: Epinephrine counters bronchospasm, vasodilation, and edema rapidly.

Q25. Which of the following is an inhaled β_2 -agonist used for acute asthma attacks?

A. Salmeterol

B. Ipratropium

C. Beclomethasone

D. Salbutamol

Correct Answer: D. Salbutamol

Explanation: Salbutamol is a short-acting β_2 agonist that causes bronchodilation.

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Q26. First-line drug for absence seizures:

- A. Phenytoin
- B. Valproic acid
- C. Ethosuximide
- D. Carbamazepine

Correct Answer: C. Ethosuximide

Explanation: Acts by inhibiting **T-type calcium channels** in thalamic neurons.

Q27. Side effect of isoniazid therapy:

- A. Peripheral neuropathy
- B. Hepatotoxicity
- C. Hemolytic anemia
- D. All of the above

Correct Answer: D. All of the above

Explanation: INH can cause **B6 deficiency**, liver injury, and hemolysis in G6PD-deficient patients.

Q28. Antidote for organophosphate poisoning:

- A. Flumazenil
- B. N-acetylcysteine
- C. Atropine + Pralidoxime
- D. Naloxone

Correct Answer: C. Atropine + Pralidoxime

Explanation: **Atropine** blocks muscarinic effects; **pralidoxime** reactivates cholinesterase.

Q29. Which anti-tuberculosis drug causes red-orange body fluids?

- A. Isoniazid
- B. Rifampin
- C. Pyrazinamide
- D. Ethambutol

Correct Answer: B. Rifampin

Explanation: Rifampin induces **CYP450** and causes **orange discoloration of secretions**.

Q30. Which class of antibiotics inhibits bacterial protein synthesis by binding the 50S subunit?

- A. Aminoglycosides
- B. Macrolides
- C. Tetracyclines
- D. Fluoroquinolones

Correct Answer: B. Macrolides

Explanation: **Macrolides** (e.g., erythromycin) inhibit protein elongation at the **50S ribosome**.

Q31. Which drug inhibits folic acid synthesis in bacteria?

- A. Penicillin
- B. Trimethoprim
- C. Ciprofloxacin
- D. Metronidazole

Correct Answer: B. Trimethoprim

Explanation: Trimethoprim inhibits **dihydrofolate reductase**, essential for DNA synthesis.

Q32. Drug causing "gray baby syndrome":

- A. Ceftriaxone
- B. Chloramphenicol
- C. Gentamicin
- D. Ampicillin

Correct Answer: B. Chloramphenicol

Explanation: Neonates lack glucuronyl transferase to metabolize **chloramphenicol**, causing toxicity.

Q33. Warfarin inhibits:

- A. Platelet aggregation
- B. Vitamin K-dependent clotting factors
- C. Thrombin directly
- D. Fibrin cross-linking

Correct Answer: B. Vitamin K-dependent clotting factors

Explanation: Warfarin blocks **vitamin K epoxide reductase**, decreasing **factors II, VII, IX, X**.

Q34. Drug of choice for status epilepticus:

- A. Phenytoin
- B. Diazepam
- C. Ethosuximide
- D. Carbamazepine

Correct Answer: B. Diazepam

Explanation: Benzodiazepines like **diazepam** act fast via **GABA-A receptor activation**.

Q35. Which of the following is a COX-2 selective inhibitor?

- A. Aspirin
- B. Ibuprofen
- C. Naproxen
- D. Celecoxib

Correct Answer: D. Celecoxib

Explanation: Celecoxib inhibits **COX-2**, reducing inflammation without gastric side effects.

Q36. Beta-lactam antibiotics work by:

- A. Inhibiting protein synthesis
- B. Inhibiting DNA gyrase
- C. Inhibiting peptidoglycan cross-linking
- D. Increasing cell wall permeability

Correct Answer: C. Inhibiting peptidoglycan cross-linking

Explanation: Bind to **penicillin-binding proteins (PBPs)**, preventing bacterial wall formation.

Q37. Which drug can cause tendon rupture?

- A. Vancomycin
- B. Ciprofloxacin
- C. Penicillin
- D. Metronidazole

Correct Answer: B. Ciprofloxacin

Explanation: **Fluoroquinolones** can damage tendons, especially in elderly and steroid users.

Q38. Drug used to prevent chemotherapy-induced nausea:

- A. Metoclopramide
- B. Loperamide
- C. Ondansetron
- D. Domperidone

Correct Answer: C. Ondansetron

Explanation: Ondansetron is a **5-HT₃ antagonist**, effective for nausea/vomiting.

Q39. Which anti-epileptic is associated with gingival hyperplasia?

- A. Carbamazepine
- B. Valproic acid
- C. Phenytoin
- D. Ethosuximide

Correct Answer: C. Phenytoin

Explanation: Long-term use of **phenytoin** causes **gingival overgrowth**.

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Q40. Tetracyclines should be avoided in:

- A. Elderly
- B. Diabetics
- C. Children under 8 years
- D. Hypertensives

Correct Answer: C. Children under 8 years

Explanation: Cause **permanent teeth discoloration** and **bone growth suppression**.

Q41. Which drug causes lactic acidosis as a rare side effect?

- A. Metformin
- B. Insulin
- C. Pioglitazone
- D. Gliclazide

Correct Answer: A. Metformin

Explanation: Especially in renal failure, **metformin** can cause **lactic acidosis**.

Q42. Side effect of aminoglycosides:

- A. Nephrotoxicity
- B. Ototoxicity
- C. Neuromuscular blockade
- D. All of the above

Correct Answer: D. All of the above

Explanation: **Gentamicin, amikacin** can cause renal and auditory damage.

Q43. A known cause of gynecomastia:

- A. Furosemide
- B. Spironolactone
- C. Atenolol
- D. Ramipril

Correct Answer: B. Spironolactone

Explanation: **Antiandrogenic** effect can lead to **breast enlargement** in males.

Q44. Which drug is a potassium-sparing diuretic?

- A. Furosemide
- B. Thiazide
- C. Spironolactone
- D. Mannitol

Correct Answer: C. Spironolactone

Explanation: It blocks aldosterone action at the **distal tubule**, retaining potassium.

Q45. Antidote for benzodiazepine overdose:

- A. Naloxone
- B. Flumazenil
- C. Atropine
- D. Pralidoxime

Correct Answer: B. Flumazenil

Explanation: Competitive antagonist at the **benzodiazepine binding site** of GABA-A receptor.

Q46. The effect of atropine on the heart is:

- A. Bradycardia
- B. Tachycardia

C. Hypotension

D. Heart block

Correct Answer: B. Tachycardia

Explanation: Atropine blocks vagal input, leading to increased heart rate.

Q47. Mechanism of action of omeprazole:

A. H₂ receptor blocker

B. Antacid

C. Proton pump inhibitor

D. Prokinetic

Correct Answer: C. Proton pump inhibitor

Explanation: Irreversibly inhibits H⁺/K⁺-ATPase in parietal cells.

Q48. Which drug causes disulfiram-like reaction?

A. Metronidazole

B. Rifampin

C. Tetracycline

D. Chloramphenicol

Correct Answer: A. Metronidazole

Explanation: Reaction occurs with alcohol due to acetaldehyde accumulation.

Q49. Methotrexate inhibits:

A. DNA polymerase

B. Dihydrofolate reductase

C. Thymidylate synthase

D. RNA polymerase

Correct Answer: B. Dihydrofolate reductase

Explanation: Prevents formation of THF, impairing nucleotide synthesis.

Q50. Antiplatelet effect of clopidogrel is due to:

A. COX inhibition

B. GpIIb/IIIa inhibition

C. ADP receptor inhibition

D. cAMP elevation

Correct Answer: C. ADP receptor inhibition

Explanation: Clopidogrel irreversibly blocks P2Y₁₂ ADP receptors on platelets.

Q51. Which local anesthetic is most cardiotoxic?

A. Lidocaine

B. Bupivacaine

C. Procaine

D. Tetracaine

Correct Answer: B. Bupivacaine

Explanation: High affinity for sodium channels and slow dissociation make bupivacaine particularly cardiotoxic.

Q52. Theophylline toxicity presents with:

A. Bradycardia and hypotension

B. Seizures and arrhythmias

C. Visual hallucinations

D. Renal failure

Correct Answer: B. Seizures and arrhythmias

Explanation: Theophylline has a narrow therapeutic index; overdose causes CNS excitation and cardiac arrhythmias.

Q53. Which drug is used as a rescue agent for warfarin over-anticoagulation?

- A. Vitamin B12
- B. Vitamin K
- C. Protamine sulfate
- D. Fresh frozen plasma

Correct Answer: B. Vitamin K (and D. Fresh frozen plasma in emergencies)

Explanation: Vitamin K reverses warfarin effects; FFP provides clotting factors immediately.

Q54. Which diuretic is carbonic anhydrase inhibitor?

- A. Hydrochlorothiazide
- B. Acetazolamide
- C. Spironolactone
- D. Furosemide

Correct Answer: B. Acetazolamide

Explanation: It inhibits carbonic anhydrase in proximal tubule, causing bicarbonate diuresis.

Q55. Which antihypertensive agent is contraindicated in asthma?

- A. Lisinopril
- B. Metoprolol
- C. Atenolol
- D. Propranolol

Correct Answer: D. Propranolol

Explanation: Non-selective β -blocker can block β_2 receptors, causing bronchoconstriction.

Q56. Which cephalosporin is effective against Pseudomonas?

- A. Cefazolin
- B. Cefuroxime
- C. Ceftriaxone
- D. Ceftazidime

Correct Answer: D. Ceftazidime

Explanation: Third-generation cephalosporin with anti-pseudomonal activity and good CNS penetration.

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Q57. Which antiarrhythmic drug prolongs AV node conduction via β -blockade?

- A. Amiodarone
- B. Metoprolol
- C. Diltiazem
- D. Digoxin

Correct Answer: B. Metoprolol

Explanation: β_1 -selective blocker reduces AV nodal conduction and heart rate.

Q58. Atropine is contraindicated in:

- A. Bradycardia
- B. Glaucoma
- C. Organophosphate poisoning
- D. Rabbit eye surgery

Correct Answer: B. Glaucoma (specifically closed-angle glaucoma)

Explanation: Atropine can precipitate acute angle-closure glaucoma by dilating the pupil.

Q59. Which drug is first-line for status asthmaticus?

- A. Fluticasone
- B. Ipratropium
- C. Salbutamol
- D. Magnesium sulfate

Correct Answer: C. Salbutamol (plus IV steroids; magnesium sulfate if severe)

Explanation: Short-acting β_2 agonist is the cornerstone of acute asthma management.

Q60. Which antibiotic can cause tendon rupture in the elderly?

- A. Azithromycin
- B. Ciprofloxacin
- C. Doxycycline
- D. Amoxicillin

Correct Answer: B. Ciprofloxacin

Explanation: Fluoroquinolones interfere with tendon matrix and degrade collagen.

Q61. Drug of choice in atrial fibrillation in WPW syndrome:

- A. Verapamil
- B. Digoxin
- C. Amiodarone
- D. Procainamide

Correct Answer: D. Procainamide

Explanation: AV nodal blocker safe in WPW; digoxin and verapamil risk paradoxical conduction.

Q62. Which drug is safest in pregnancy for hypothyroidism?

- A. Methimazole
- B. Propylthiouracil
- C. Radioactive iodine
- D. Levothyroxine

Correct Answer: D. Levothyroxine

Explanation: Synthetic T_4 replacement safe in pregnancy; PTU is used for hyperthyroid states.

Q63. Drug used to reduce intracranial pressure:

- A. Mannitol
- B. Furosemide
- C. Acetazolamide
- D. Hydrochlorothiazide

Correct Answer: A. Mannitol

Explanation: Osmotic diuretic that pulls water from cerebral tissue.

Q64. Which antibiotic is teratogenic and causes gray baby syndrome?

- A. Chloramphenicol
- B. Tetracycline
- C. Clindamycin
- D. Penicillin

Correct Answer: A. Chloramphenicol

Explanation: Can cross placenta and causes neonatal bone marrow suppression.

Q65. Eplerenone differs from spironolactone by:

- A. Less antiandrogenic effect
- B. Stronger diuresis
- C. Lower potassium retention
- D. Lower GI side effects

Correct Answer: A. Less antiandrogenic effect

Explanation: Eplerenone is a more selective aldosterone antagonist with fewer hormonal side effects.

Q66. Which class of drugs induces CYP450 and decreases effectiveness of warfarin?

- A. Penicillins
- B. Barbiturates

C. ACE inhibitors

D. Omeprazole

Correct Answer: B. Barbiturates

Explanation: Induces hepatic enzymes, accelerating warfarin metabolism.

Q67. Which proton pump inhibitor is most potent?

A. Pantoprazole

B. Lansoprazole

C. Omeprazole

D. Esomeprazole

Correct Answer: D. Esomeprazole

Explanation: It's the S-enantiomer of omeprazole with improved efficacy.

Q68. Which antiplatelet drug should be stopped 5 days before surgery?

A. Aspirin

B. Clopidogrel

C. Warfarin

D. Heparin

Correct Answer: B. Clopidogrel

Explanation: Discontinued ~5 days before to restore platelet function.

Q69. Which antifungal is nephrotoxic due to liposomal formulation?

A. Fluconazole

B. Amphotericin B

C. Nystatin

D. Itraconazole

Correct Answer: B. Amphotericin B

Explanation: Formulated in lipid carriers to reduce toxicity, but renal effects still present.

Q70. Which antibiotic inhibits DNA gyrase?

A. Tetracycline

B. Ciprofloxacin

C. Macrolides

D. Aminoglycosides

Correct Answer: B. Ciprofloxacin

Explanation: Fluoroquinolone that blocks bacterial DNA replication.

Q71. Drug causing red-man syndrome:

A. Vancomycin

B. Gentamicin

C. Aztreonam

D. Cefazolin

Correct Answer: A. Vancomycin

Explanation: Rapid infusion causes histamine release, leading to flushing and hypotension.

Q72. Nitroprusside toxicity presents with:

A. Cyanosis

B. Visual disturbances

C. Cyanide poisoning

D. Hypocalcemia

Correct Answer: C. Cyanide poisoning

Explanation: Prolonged infusion can release cyanide ions, causing metabolic acidosis and coma.

Q73. Which opioid is safest for patients with renal failure?

- A. Morphine
- B. Meperidine
- C. Fentanyl
- D. Codeine

Correct Answer: C. Fentanyl

Explanation: Active metabolites of morphine and meperidine accumulate; fentanyl is safer.

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Q74. Which is an HMG-CoA reductase inhibitor?

- A. Ezetimibe
- B. Atorvastatin
- C. Niacin
- D. Gemfibrozil

Correct Answer: B. Atorvastatin

Explanation: Lowers LDL by inhibiting the rate-limiting step in cholesterol synthesis.

Q75. Which drug raises HDL significantly?

- A. Simvastatin
- B. Niacin (Vitamin B3)
- C. Ezetimibe
- D. Furosemide

Correct Answer: B. Niacin

Explanation: Increases HDL by inhibiting hepatic lipase and promoting HDL production.

Q76. Thrombolytic drug alteplase acts by converting plasminogen to:

- A. Thrombin
- B. Plasmin
- C. Urokinase
- D. Plasminogen activator inhibitor

Correct Answer: B. Plasmin

Explanation: Plasmin dissolves fibrin clots, used in acute MI and stroke.

Q77. Which drug is a selective COX-2 inhibitor?

- A. Aspirin
- B. Indomethacin
- C. Naproxen
- D. Celecoxib

Correct Answer: D. Celecoxib

Explanation: Selectively blocks COX-2, reducing inflammation with fewer GI risks.

Q78. Which antidiabetic drug activates PPAR-γ?

- A. Metformin
- B. Pioglitazone
- C. Glipizide
- D. Saxagliptin

Correct Answer: B. Pioglitazone

Explanation: Thiazolidinedione that improves insulin sensitivity by activating PPAR-γ.

Q79. Which antiviral drug is a neuraminidase inhibitor?

- A. Acyclovir
- B. Zidovudine
- C. Oseltamivir
- D. Ribavirin

Correct Answer: C. Oseltamivir

Explanation: Blocks influenza neuraminidase, preventing virus release from cells.

Q80. Which of the following is a benzodiazepine with active metabolites?

- A. Diazepam
- B. Lorazepam
- C. Oxazepam
- D. Temazepam

Correct Answer: A. Diazepam

Explanation: Long-acting metabolite leads to prolonged effects, especially in the elderly.

Q81. Which immunosuppressant inhibits calcineurin?

- A. Azathioprine
- B. Cyclosporine
- C. Methotrexate
- D. Sirolimus

Correct Answer: B. Cyclosporine

Explanation: Prevents T-cell activation by blocking IL-2 transcription.

Q82. Which drug causes gingival hyperplasia and hirsutism as adverse effects?

- A. Furosemide
- B. Phenytoin
- C. Carbamazepine
- D. Lamotrigine

Correct Answer: B. Phenytoin

Explanation: Chronic phenytoin use can lead to **gum overgrowth** and hair growth.

Q83. Methyldopa's antihypertensive effect is due to:

- A. Central α_2 agonism
- B. Alpha-1 receptor blockade
- C. Beta-1 blockade
- D. ACE inhibition

Correct Answer: A. Central α_2 agonism

Explanation: Reduces sympathetic outflow from CNS, lowering BP.

Q84. Which antimalarial causes blurred vision and cardiomyopathy on prolonged use?

- A. Chloroquine
- B. Mefloquine
- C. Artemisinin
- D. Quinine

Correct Answer: A. Chloroquine

Explanation: Can cause retinal toxicity ("bull's eye maculopathy") and cardiomyopathy.

Q85. Which drug is a dual endothelin receptor antagonist used in pulmonary hypertension?

- A. Sildenafil
- B. Bosentan
- C. Epoprostenol
- D. Nitric oxide

Correct Answer: B. Bosentan

Explanation: Blocks endothelin-1 receptors, reducing vascular resistance in lungs.

Q86. Which chemotherapy drug causes hemorrhagic cystitis?

- A. Cyclophosphamide
- B. Methotrexate
- C. Paclitaxel
- D. Cisplatin

Correct Answer: A. Cyclophosphamide

Explanation: Its metabolite acrolein irritates the bladder; prevented by hydration or MESNA.

Q87. Which drug is a monoclonal antibody against EGFR?

- A. Rituximab
- B. Trastuzumab
- C. Cetuximab
- D. Bevacizumab

Correct Answer: C. Cetuximab

Explanation: Binds EGFR on colon and head/neck cancer cells, inhibiting signaling.

Q88. Rasburicase is used to prevent tumor lysis syndrome because it:

- A. Chelates uric acid
- B. Converts uric acid to allantoin
- C. Inhibits xanthine oxidase
- D. Promotes uric acid excretion

Correct Answer: B. Converts uric acid to allantoin

Explanation: More soluble and easily excreted metabolite to prevent kidney damage.

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Q89. Which drug is used for alcohol withdrawal seizures?

- A. Phenytoin
- B. Diazepam
- C. Carbamazepine
- D. Valproate

Correct Answer: B. Diazepam

Explanation: Enhances GABA-mediated inhibition to suppress seizures and agitation.

Q90. Which drug interferes with vitamin K recycling?

- A. Warfarin
- B. Heparin
- C. Aspirin
- D. Clopidogrel

Correct Answer: A. Warfarin

Explanation: Inhibits vitamin K epoxide reductase.

Q91. Which drug class is indicated for diabetic neuropathy?

- A. Metformin
- B. SNRIs (e.g., duloxetine)
- C. Statins
- D. Beta-blockers

Correct Answer: B. SNRIs (e.g., duloxetine)

Explanation: Duloxetine modulates pain pathways and is approved for diabetic neuropathy.

Q92. Which anticonvulsant is teratogenic?

- A. Lamotrigine
- B. Ethosuximide
- C. Valproic acid
- D. Levetiracetam

Correct Answer: C. Valproic acid

Explanation: High risk of neural tube defects and other malformations in fetus.

Q93. Aliskiren acts by:

- A. ACE inhibition
- B. Direct renin inhibition

C. Angiotensin receptor blockade

D. Aldosterone antagonism

Correct Answer: B. Direct renin inhibition

Explanation: Aliskiren blocks renin activity, reducing angiotensin I and II formation.

Q94. Which drug is useful in sulfa allergy treatment for leprosy?

A. Dapsone

B. Rifampin

C. Clofazimine

D. Minocycline

Correct Answer: C. Clofazimine

Explanation: Non-sulfonamide antibiotic effective against *Mycobacterium leprae*.

Q95. Which antipsychotic has the lowest risk of extrapyramidal side effects?

A. Haloperidol

B. Risperidone

C. Clozapine

D. Fluphenazine

Correct Answer: C. Clozapine

Explanation: An atypical antipsychotic with minimal EPS but risk of agranulocytosis.

Q96. Which of the following is the reversal agent for dabigatran?

A. Vitamin K

B. Protamine

C. Idarucizumab

D. Andexanet alfa

Correct Answer: C. Idarucizumab

Explanation: A monoclonal antibody fragment that binds dabigatran and reverses anticoagulation.

Q97. Which drug is used to treat hypertension in pheochromocytoma?

A. Propranolol

B. Phenoxybenzamine

C. Labetalol

D. Metoprolol

Correct Answer: B. Phenoxybenzamine

Explanation: Non-selective, irreversible α -blocker used before surgical tumor removal.

Q98. Which hepatitis C antiviral is a protease inhibitor?

A. Sofosbuvir

B. Ribavirin

C. Simeprevir

D. Interferon α

Correct Answer: C. Simeprevir

Explanation: Targets NS3/4A protease crucial for HCV replication.

Q99. Which drug should be avoided in acute angle-closure glaucoma?

A. Pilocarpine

B. Timolol

C. Atropine

D. Acetazolamide

Correct Answer: C. Atropine

Explanation: Causes pupil dilation, precipitating acute glaucoma by narrowing the angle.

Q100. Which drug is used for acute relief of paroxysmal supraventricular tachycardia?

- A. Adenosine
- B. Verapamil
- C. Digoxin
- D. Sotalol

Correct Answer: A. Adenosine

Explanation: Extremely short-acting, causes AV node block to terminate SVT.

Q101. Which of the following is the most common side effect of isoniazid?

- A. Peripheral neuropathy
- B. Nephrotoxicity
- C. Optic neuritis
- D. Ototoxicity

Correct Answer: A. Peripheral neuropathy

Explanation: Due to pyridoxine (Vitamin B6) deficiency; prophylactic B6 is often co-prescribed.

Q102. Which of the following drugs is used to treat opioid-induced constipation?

- A. Loperamide
- B. Methylnaltrexone
- C. Lactulose
- D. Docusate

Correct Answer: B. Methylnaltrexone

Explanation: Peripheral opioid receptor antagonist that does not cross the blood-brain barrier.

Q103. Which anti-diabetic drug has the highest risk of hypoglycemia?

- A. Metformin
- B. Glibenclamide
- C. Pioglitazone
- D. Sitagliptin

Correct Answer: B. Glibenclamide

Explanation: Sulfonylureas increase insulin release regardless of glucose level.

Q104. Which of the following is a long-acting insulin?

- A. Regular insulin
- B. NPH
- C. Glargine
- D. Lispro

Correct Answer: C. Glargine

Explanation: Glargine provides basal insulin coverage for up to 24 hours.

Q105. The mechanism of action of sucralfate is:

- A. Antacid
- B. Proton pump inhibitor
- C. Protective coating of ulcers
- D. H2-receptor antagonist

Correct Answer: C. Protective coating of ulcers

Explanation: Forms a protective barrier over ulcers in acidic pH.

Q106. Which anti-epileptic drug is associated with Stevens-Johnson syndrome?

- A. Levetiracetam
- B. Ethosuximide
- C. Lamotrigine
- D. Gabapentin

Correct Answer: C. Lamotrigine

Explanation: Risk increases with rapid dose escalation; slow titration is recommended.

Q107. A known adverse effect of amiodarone is:

- A. Renal failure
- B. Pulmonary fibrosis
- C. Torsades de pointes
- D. Retinopathy

Correct Answer: B. Pulmonary fibrosis

Explanation: Also causes thyroid dysfunction, hepatotoxicity, and corneal deposits.

Q108. Which of the following is a GnRH analog used in prostate cancer?

- A. Clomiphene
- B. Leuprolide
- C. Finasteride
- D. Tamoxifen

Correct Answer: B. Leuprolide

Explanation: Continuous use suppresses LH/FSH, lowering testosterone levels.

Q109. Which drug can cause irreversible ototoxicity?

- A. Amikacin
- B. Chloramphenicol
- C. Rifampin
- D. Azithromycin

Correct Answer: A. Amikacin

Explanation: Aminoglycosides accumulate in inner ear and cause hearing loss.

Q110. The most appropriate drug for hypertensive emergency in pregnancy is:

- A. Enalapril
- B. Methyldopa
- C. Hydralazine
- D. Atenolol

Correct Answer: C. Hydralazine

Explanation: Arteriolar vasodilator used for rapid BP control during pregnancy.

Q111. The main use of erythropoietin therapy is in:

- A. Neutropenia
- B. Thrombocytopenia
- C. Anemia of chronic kidney disease
- D. Iron deficiency anemia

Correct Answer: C. Anemia of chronic kidney disease

Explanation: Stimulates erythroid progenitors in bone marrow.

Q112. Which of the following drugs causes disulfiram-like reaction?

- A. Metronidazole
- B. Fluconazole
- C. Tetracycline
- D. Clarithromycin

Correct Answer: A. Metronidazole

Explanation: Inhibits aldehyde dehydrogenase → acetaldehyde buildup → nausea, vomiting with alcohol.

Q113. Drug of choice for preventing vertical transmission of HIV in pregnancy:

- A. Efavirenz
- B. Nevirapine
- C. Zidovudine
- D. Tenofovir

Correct Answer: C. Zidovudine

Explanation: Administered to mother during labor and to neonate for post-exposure prophylaxis.

Q114. Which of the following is a dopamine antagonist used as an antiemetic?

- A. Metoclopramide
- B. Ondansetron
- C. Loperamide
- D. Ranitidine

Correct Answer: A. Metoclopramide

Explanation: Blocks D₂ receptors in the CTZ (chemoreceptor trigger zone).

Q115. A serious complication of clozapine therapy is:

- A. Hypertension
- B. Agranulocytosis
- C. Seizures
- D. EPS

Correct Answer: B. Agranulocytosis

Explanation: Requires routine WBC/ANC monitoring to prevent fatal infections.

Q116. Which anti-diabetic agent is a GLP-1 receptor agonist?

- A. Sitagliptin
- B. Glimepiride
- C. Exenatide
- D. Pioglitazone

Correct Answer: C. Exenatide

Explanation: Enhances glucose-dependent insulin secretion and delays gastric emptying.

Q117. Which drug class is associated with "first-dose hypotension"?

- A. Calcium channel blockers
- B. Diuretics
- C. ACE inhibitors
- D. Beta-blockers

Correct Answer: C. ACE inhibitors

Explanation: Sudden vasodilation can lead to hypotension, especially with volume depletion.

Q118. Which drug is a selective estrogen receptor modulator (SERM)?

- A. Letrozole
- B. Raloxifene
- C. Flutamide
- D. Finasteride

Correct Answer: B. Raloxifene

Explanation: Estrogen agonist in bone, antagonist in breast and uterus.

Q119. Which antihypertensive can cause a dry cough?

- A. Amlodipine
- B. Losartan
- C. Enalapril
- D. Spironolactone

Correct Answer: C. Enalapril

Explanation: Due to bradykinin accumulation from ACE inhibition.

Q120. The most common side effect of SSRIs is:

- A. Weight gain
- B. Sexual dysfunction

C. Arrhythmia

D. Liver toxicity

Correct Answer: B. Sexual dysfunction

Explanation: Common and often a reason for non-compliance.

Q121. Which drug inhibits bacterial transpeptidase?

A. Vancomycin

B. Penicillin

C. Tetracycline

D. Gentamicin

Correct Answer: B. Penicillin

Explanation: Inhibits cross-linking of peptidoglycan in bacterial cell walls.

Q122. A loop diuretic causes:

A. Hyperkalemia

B. Hypocalcemia

C. Hypercalcemia

D. Hyponatremia

Correct Answer: B. Hypocalcemia

Explanation: Loop diuretics increase calcium excretion.

Q123. Which of the following is an alpha-1 blocker used in BPH?

A. Propranolol

B. Terazosin

C. Lisinopril

D. Verapamil

Correct Answer: B. Terazosin

Explanation: Relaxes smooth muscle in bladder neck and prostate.

Q124. Which drug is a DPP-4 inhibitor?

A. Glibenclamide

B. Saxagliptin

C. Exenatide

D. Pioglitazone

Correct Answer: B. Saxagliptin

Explanation: Prolongs action of endogenous incretins.

Q125. Which of the following antibiotics is safe in pregnancy?

A. Tetracycline

B. Streptomycin

C. Amoxicillin

D. Ciprofloxacin

Correct Answer: C. Amoxicillin

Explanation: Beta-lactam; safe during all trimesters.

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Q126. Which of the following is a direct thrombin inhibitor?

A. Warfarin

B. Dabigatran

C. Heparin

D. Rivaroxaban

Correct Answer: B. Dabigatran

Explanation: Oral direct thrombin (factor IIa) inhibitor.

Q127. Which anti-HIV drug causes nephrolithiasis?

- A. Tenofovir
- B. Zidovudine
- C. Indinavir
- D. Efavirenz

Correct Answer: C. Indinavir

Explanation: Protease inhibitor that can crystallize in urine.

Q128. Which of the following agents increases insulin sensitivity?

- A. Metformin
- B. Sulfonylureas
- C. Sitagliptin
- D. Alpha-glucosidase inhibitors

Correct Answer: A. Metformin

Explanation: Improves peripheral glucose uptake and hepatic insulin sensitivity.

Q129. Drug causing orange discoloration of urine:

- A. INH
- B. Rifampin
- C. Pyrazinamide
- D. Ethambutol

Correct Answer: B. Rifampin

Explanation: Due to pigmented metabolites excreted in fluids.

Q130. Which drug causes dose-dependent thrombocytopenia?

- A. Aspirin
- B. Heparin
- C. Warfarin
- D. Ticlopidine

Correct Answer: B. Heparin

Explanation: Can cause HIT (Heparin-induced thrombocytopenia) due to IgG antibodies.

Q131. The mechanism of action of omeprazole:

- A. Blocks H₂ receptors
- B. Neutralizes gastric acid
- C. Irreversible proton pump inhibition
- D. Stimulates mucus secretion

Correct Answer: C. Irreversible proton pump inhibition

Explanation: Inhibits H⁺/K⁺ ATPase in parietal cells.

Q132. Which insulin preparation has the fastest onset?

- A. NPH
- B. Glargine
- C. Lispro
- D. Regular insulin

Correct Answer: C. Lispro

Explanation: Rapid-acting insulin analog used before meals.

Q133. Long-term use of proton pump inhibitors can lead to:

- A. Hyperkalemia
- B. Osteoporosis
- C. Hypoglycemia
- D. Arrhythmias

Correct Answer: B. Osteoporosis

Explanation: Due to reduced calcium absorption.

Q134. A side effect of streptomycin:

- A. Nephrotoxicity
- B. Hepatotoxicity
- C. Ototoxicity
- D. Rash

Correct Answer: C. Ototoxicity

Explanation: Aminoglycosides damage vestibular and cochlear hair cells.

Q135. Which drug is used in the treatment of carcinoid syndrome?

- A. Ranitidine
- B. Ondansetron
- C. Octreotide
- D. Cisplatin

Correct Answer: C. Octreotide

Explanation: Synthetic somatostatin analog suppresses serotonin release.

Q136. Drug contraindicated in pregnancy due to cartilage toxicity:

- A. Tetracycline
- B. Fluoroquinolones
- C. Chloramphenicol
- D. Penicillin

Correct Answer: B. Fluoroquinolones

Explanation: Affects cartilage development in fetus.

Q137. Adverse effect of valproic acid:

- A. Pancreatitis
- B. Anemia
- C. Hypertension
- D. Renal failure

Correct Answer: A. Pancreatitis

Explanation: Rare but serious; also hepatotoxicity and neural tube defects.

Q138. Drug used to prevent chemotherapy-induced neutropenia:

- A. Erythropoietin
- B. Filgrastim
- C. Interferon
- D. Interleukin-2

Correct Answer: B. Filgrastim

Explanation: G-CSF analog stimulates neutrophil production.

Q139. Which of the following drugs causes gingival hyperplasia?

- A. Carbamazepine
- B. Phenytoin
- C. Phenobarbital
- D. Topiramate

Correct Answer: B. Phenytoin

Explanation: Chronic use stimulates fibroblast proliferation in gingiva.

Q140. The antidote for methotrexate toxicity is:

- A. Vitamin B6
- B. Folinic acid (Leucovorin)
- C. Vitamin K
- D. Acetylcysteine

Correct Answer: B. Folinic acid (Leucovorin)

Explanation: Bypasses the blockade of dihydrofolate reductase.

Q141. Which drug may cause nephrogenic diabetes insipidus?

- A. Spironolactone
- B. Furosemide
- C. Lithium
- D. Carbamazepine

Correct Answer: C. Lithium

Explanation: Reduces responsiveness of collecting ducts to ADH.

Q142. A muscarinic antagonist used to treat motion sickness:

- A. Diphenhydramine
- B. Scopolamine
- C. Atropine
- D. Meclizine

Correct Answer: B. Scopolamine

Explanation: Blocks cholinergic input to the vomiting center.

Q143. Drug that reverses warfarin anticoagulation:

- A. Vitamin K
- B. Protamine
- C. Heparin
- D. Desmopressin

Correct Answer: A. Vitamin K

Explanation: Promotes synthesis of clotting factors II, VII, IX, and X.

Q144. Which anti-cancer drug inhibits microtubule depolymerization?

- A. Vincristine
- B. Paclitaxel
- C. Methotrexate
- D. Cyclophosphamide

Correct Answer: B. Paclitaxel

Explanation: Stabilizes microtubules and prevents anaphase.

Q145. Most significant toxicity of cisplatin:

- A. Cardiotoxicity
- B. Hepatotoxicity
- C. Nephrotoxicity
- D. Pulmonary toxicity

Correct Answer: C. Nephrotoxicity

Explanation: Hydration and amifostine reduce risk.

Q146. Antifungal drug causing gynecomastia:

- A. Griseofulvin
- B. Ketoconazole
- C. Amphotericin B
- D. Nystatin

Correct Answer: B. Ketoconazole

Explanation: Inhibits steroid synthesis in adrenal and gonads.

Q147. Drug used in Parkinson's disease to delay L-DOPA breakdown:

- A. Selegiline
- B. Carbidopa

C. Ropinirole

D. Entacapone

Correct Answer: D. Entacapone

Explanation: COMT inhibitor that prolongs L-DOPA action.

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Q148. Drug of choice in open-angle glaucoma:

A. Atropine

B. Timolol

C. Epinephrine

D. Pilocarpine

Correct Answer: B. Timolol

Explanation: Reduces aqueous humor production via β -blockade.

Q149. Drug used for opioid withdrawal maintenance therapy:

A. Methadone

B. Naltrexone

C. Naloxone

D. Clonidine

Correct Answer: A. Methadone

Explanation: Long-acting opioid agonist prevents withdrawal.

Q150. Which drug causes serotonin syndrome if combined with MAOIs?

A. Haloperidol

B. Fluoxetine

C. Diazepam

D. Bupropion

Correct Answer: B. Fluoxetine

Explanation: SSRIs + MAOIs cause excessive serotonin $\rightarrow$ hyperthermia, agitation, seizures.

Q151. Which of the following drugs is a protease inhibitor used in HIV treatment?

A. Zidovudine

B. Efavirenz

C. Ritonavir

D. Tenofovir

Correct Answer: C. Ritonavir

Explanation: Ritonavir inhibits HIV protease and is also used to boost levels of other protease inhibitors by CYP450 inhibition.

Q152. The most appropriate anti-hypertensive in a diabetic patient with proteinuria is:

A. Beta-blocker

B. Calcium channel blocker

C. ACE inhibitor

D. Loop diuretic

Correct Answer: C. ACE inhibitor

Explanation: ACE inhibitors reduce intraglomerular pressure and are renoprotective in diabetic nephropathy.

Q153. The drug of choice for essential tremor is:

A. Levodopa

B. Propranolol

C. Diazepam

D. Phenytoin

Correct Answer: B. Propranolol

Explanation: Non-selective β -blocker used for symptomatic relief of essential tremors.

Q154. The most common side effect of statins is:

- A. Hepatotoxicity
- B. Rhabdomyolysis
- C. Myalgia
- D. Constipation

Correct Answer: C. Myalgia

Explanation: Muscle aches are the most frequent adverse effect and may precede rhabdomyolysis.

Q155. The antidote for benzodiazepine overdose is:

- A. Atropine
- B. Naloxone
- C. Flumazenil
- D. Physostigmine

Correct Answer: C. Flumazenil

Explanation: Flumazenil competitively inhibits benzodiazepine binding at the GABA-A receptor.

Q156. Which of the following drugs inhibits bacterial DNA gyrase?

- A. Amoxicillin
- B. Ciprofloxacin
- C. Erythromycin
- D. Doxycycline

Correct Answer: B. Ciprofloxacin

Explanation: Fluoroquinolones inhibit DNA gyrase and topoisomerase IV, disrupting DNA replication.

Q157. The drug of choice for absence seizures is:

- A. Phenytoin
- B. Carbamazepine
- C. Ethosuximide
- D. Gabapentin

Correct Answer: C. Ethosuximide

Explanation: Ethosuximide suppresses T-type calcium currents in thalamic neurons.

Q158. An adverse effect of aminoglycosides is:

- A. Hepatotoxicity
- B. Ototoxicity
- C. Hyperkalemia
- D. Hypotension

Correct Answer: B. Ototoxicity

Explanation: Aminoglycosides cause irreversible damage to the vestibular and auditory apparatus.

Q159. Which of the following drugs inhibits xanthine oxidase?

- A. Allopurinol
- B. Colchicine
- C. Probenecid
- D. Aspirin

Correct Answer: A. Allopurinol

Explanation: Used in chronic gout to reduce uric acid synthesis.

Q160. Which of the following is a loop diuretic?

- A. Spironolactone
- B. Chlorthalidone
- C. Furosemide
- D. Amiloride

Correct Answer: C. Furosemide

Explanation: Furosemide inhibits $\text{Na}^+/\text{K}^+/\text{2Cl}^-$ transporter in the thick ascending loop of Henle.

Q161. Which of the following drugs causes gingival hyperplasia?

- A. Valproic acid
- B. Phenytoin
- C. Carbamazepine
- D. Levetiracetam

Correct Answer: B. Phenytoin

Explanation: Chronic use of phenytoin stimulates fibroblast proliferation.

Q162. Which drug can cause thyroid dysfunction?

- A. Digoxin
- B. Amiodarone
- C. Verapamil
- D. Metoprolol

Correct Answer: B. Amiodarone

Explanation: Contains iodine and can cause hypo- or hyperthyroidism.

Q163. Which anti-hypertensive class is known to cause hyperkalemia?

- A. Calcium channel blockers
- B. ACE inhibitors
- C. Loop diuretics
- D. Thiazides

Correct Answer: B. ACE inhibitors

Explanation: ACE inhibitors reduce aldosterone, leading to potassium retention.

Q164. Which of the following drugs is most likely to cause photosensitivity?

- A. Doxycycline
- B. Ciprofloxacin
- C. Amiodarone
- D. All of the above

Correct Answer: D. All of the above

Explanation: These drugs sensitize skin to UV radiation, leading to phototoxic reactions.

Q165. Which anti-TB drug causes retrobulbar neuritis?

- A. Rifampin
- B. Isoniazid
- C. Pyrazinamide
- D. Ethambutol

Correct Answer: D. Ethambutol

Explanation: Causes optic neuritis—red-green color blindness is an early sign.

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Q166. Which antiemetic is a 5-HT₃ receptor antagonist?

- A. Metoclopramide
- B. Promethazine
- C. Ondansetron
- D. Scopolamine

Correct Answer: C. Ondansetron

Explanation: Used in chemotherapy-induced and postoperative nausea.

Q167. Which of the following is the antidote for digoxin toxicity?

- A. Vitamin K
- B. Atropine

C. Digoxin-specific antibody (Digibind)

D. Magnesium

Correct Answer: C. Digoxin-specific antibody (Digibind)

Explanation: Binds free digoxin, reversing its effects on the heart.

Q168. Methotrexate toxicity can be minimized by:

A. Folic acid

B. Folinic acid (Leucovorin)

C. Vitamin B12

D. Pyridoxine

Correct Answer: B. Folinic acid (Leucovorin)

Explanation: Bypasses dihydrofolate reductase block to rescue normal cells.

Q169. Drug that inhibits DNA synthesis in herpes virus:

A. Ribavirin

B. Acyclovir

C. Zidovudine

D. Oseltamivir

Correct Answer: B. Acyclovir

Explanation: Acyclovir is activated by viral thymidine kinase and inhibits viral DNA polymerase.

Q170. The most appropriate drug for treating tremors in Parkinsonism is:

A. Levodopa

B. Benztropine

C. Bromocriptine

D. Selegiline

Correct Answer: B. Benztropine

Explanation: Anticholinergic used to control tremor and rigidity.

Q171. Antidote for methanol poisoning:

A. Ethanol

B. Atropine

C. Acetylcysteine

D. Vitamin K

Correct Answer: A. Ethanol

Explanation: Competes for alcohol dehydrogenase, preventing toxic metabolite formation.

Q172. Which of the following is a reversible anticholinesterase?

A. Atropine

B. Neostigmine

C. Pralidoxime

D. Scopolamine

Correct Answer: B. Neostigmine

Explanation: Inhibits acetylcholinesterase → increases ACh levels; used in myasthenia gravis.

Q173. Which antifungal inhibits ergosterol synthesis?

A. Amphotericin B

B. Griseofulvin

C. Ketoconazole

D. Nystatin

Correct Answer: C. Ketoconazole

Explanation: Inhibits fungal cytochrome P450 enzyme lanosterol demethylase.

Q174. Treatment of choice for neurocysticercosis:

A. Mebendazole

B. Praziquantel

C. Albendazole

D. Ivermectin

Correct Answer: C. Albendazole

Explanation: Albendazole is more effective in CNS cystic lesions than praziquantel.

Q175. Drug used to prevent chemotherapy-induced neutropenia:

A. Filgrastim

B. Erythropoietin

C. Interleukin-2

D. GM-CSF

Correct Answer: A. Filgrastim

Explanation: G-CSF analog stimulates neutrophil proliferation and differentiation.

Q176. Anticoagulant safe in pregnancy:

A. Warfarin

B. Heparin

C. Rivaroxaban

D. Dabigatran

Correct Answer: B. Heparin

Explanation: Heparin does not cross the placenta; warfarin is teratogenic.

Q177. Which class of drugs cause "red man syndrome"?

A. Aminoglycosides

B. Tetracyclines

C. Glycopeptides (Vancomycin)

D. Macrolides

Correct Answer: C. Glycopeptides (Vancomycin)

Explanation: Histamine-mediated reaction during rapid infusion; slow infusion prevents it.

Q178. Which oral hypoglycemic drug causes lactic acidosis?

A. Glipizide

B. Metformin

C. Acarbose

D. Pioglitazone

Correct Answer: B. Metformin

Explanation: Rare but serious adverse effect; increased risk with renal failure.

Q179. Which of the following is a selective α_1 antagonist used in BPH?

A. Tamsulosin

B. Propranolol

C. Lisinopril

D. Prazosin

Correct Answer: A. Tamsulosin

Explanation: Selectively relaxes smooth muscle in prostate and bladder neck.

Q180. Mechanism of action of sildenafil:

A. PDE3 inhibitor

B. PDE5 inhibitor

C. cAMP activator

D. Guanylate cyclase inhibitor

Correct Answer: B. PDE5 inhibitor

Explanation: Inhibits breakdown of cGMP → smooth muscle relaxation in corpus cavernosum.

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Q181. Which of the following agents is used for medical abortion?

- A. Levonorgestrel
- B. Methotrexate
- C. Mifepristone
- D. Misoprostol

Correct Answer: C. Mifepristone

Explanation: Progesterone receptor antagonist; followed by misoprostol for uterine contraction.

Q182. Which drug inhibits dihydrofolate reductase?

- A. Methotrexate
- B. 5-Fluorouracil
- C. Cyclophosphamide
- D. Cisplatin

Correct Answer: A. Methotrexate

Explanation: Prevents synthesis of tetrahydrofolate, inhibiting DNA synthesis.

Q183. Which drug causes blue-gray skin discoloration?

- A. Minocycline
- B. Amiodarone
- C. Diltiazem
- D. Propranolol

Correct Answer: B. Amiodarone

Explanation: Due to skin deposition and photosensitivity.

Q184. Drug used for prevention of NSAID-induced ulcers:

- A. Omeprazole
- B. Misoprostol
- C. Sucralfate
- D. Ranitidine

Correct Answer: B. Misoprostol

Explanation: PGE1 analog that increases gastric mucus and bicarbonate secretion.

Q185. Levodopa is combined with carbidopa to:

- A. Increase CNS availability
- B. Reduce tachycardia
- C. Prevent seizures
- D. Block dopamine receptors

Correct Answer: A. Increase CNS availability

Explanation: Carbidopa inhibits peripheral DOPA decarboxylase, allowing more levodopa to reach brain.

Q186. Which of the following causes nephrotoxicity and ototoxicity?

- A. Tetracycline
- B. Gentamicin
- C. Chloramphenicol
- D. Ciprofloxacin

Correct Answer: B. Gentamicin

Explanation: Aminoglycoside-induced toxicity, especially in renal impairment.

Q187. Which of the following is a beta-blocker with alpha-blocking activity?

- A. Atenolol
- B. Propranolol
- C. Labetalol
- D. Esmolol

Correct Answer: C. Labetalol

Explanation: Used in hypertensive emergencies and pregnancy.

Q188. Which of the following is contraindicated in serotonin syndrome?

- A. Diazepam
- B. Cyproheptadine
- C. Linezolid
- D. Dantrolene

Correct Answer: C. Linezolid

Explanation: Linezolid is a weak MAOI and may worsen serotonin syndrome.

Q189. Drug used in hepatic encephalopathy:

- A. Lactulose
- B. Neomycin
- C. Rifaximin
- D. All of the above

Correct Answer: D. All of the above

Explanation: Lactulose traps ammonia; antibiotics reduce ammonia-producing bacteria.

Q190. Drug of choice for trichomoniasis:

- A. Mebendazole
- B. Metronidazole
- C. Albendazole
- D. Tinidazole

Correct Answer: B. Metronidazole

Explanation: Effective against anaerobic protozoa; both partners should be treated.

Q191. Which drug acts by stabilizing tubulin polymerization?

- A. Vincristine
- B. Paclitaxel
- C. Methotrexate
- D. Cyclophosphamide

Correct Answer: B. Paclitaxel

Explanation: Prevents microtubule disassembly, blocking mitosis.

Q192. The most serious side effect of clozapine is:

- A. Weight gain
- B. Tardive dyskinesia
- C. Agranulocytosis
- D. Hypoglycemia

Correct Answer: C. Agranulocytosis

Explanation: Requires regular WBC monitoring.

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Q193. Which immunosuppressant inhibits IL-2 transcription?

- A. Sirolimus
- B. Azathioprine
- C. Cyclosporine
- D. Methotrexate

Correct Answer: C. Cyclosporine

Explanation: Calcineurin inhibitor that prevents T-cell activation.

Q194. Which of the following causes ototoxicity and red urine?

- A. Rifampin
- B. Doxorubicin
- C. Cisplatin

D. Hydroxyurea

Correct Answer: B. Doxorubicin

Explanation: Anthracycline; also cardiotoxic and causes red-colored body fluids.

Q195. Which is the drug of choice for treatment of Mycoplasma pneumonia?

A. Penicillin

B. Amoxicillin

C. Erythromycin

D. Ceftriaxone

Correct Answer: C. Erythromycin

Explanation: Mycoplasma lacks cell wall; macrolides inhibit protein synthesis.

Q196. Which anti-cancer drug is most associated with cardiotoxicity?

A. Cisplatin

B. Bleomycin

C. Doxorubicin

D. Vinblastine

Correct Answer: C. Doxorubicin

Explanation: Dose-dependent cardiomyopathy due to free radical generation.

Q197. Which antibiotic causes tendon rupture?

A. Erythromycin

B. Amoxicillin

C. Ciprofloxacin

D. Ceftriaxone

Correct Answer: C. Ciprofloxacin

Explanation: Fluoroquinolones impair collagen and tendon matrix integrity.

Q198. Which of the following drugs is a long-acting insulin?

A. Lispro

B. Aspart

C. NPH

D. Glargine

Correct Answer: D. Glargine

Explanation: Peakless, once-daily basal insulin.

Q199. Which class of drug is most associated with lupus-like syndrome?

A. ACE inhibitors

B. Beta-blockers

C. Hydralazine

D. Calcium channel blockers

Correct Answer: C. Hydralazine

Explanation: Drug-induced lupus with anti-histone antibodies.

Q200. Which drug prevents P. vivax relapse?

A. Chloroquine

B. Artemisinin

C. Primaquine

D. Mefloquine

Correct Answer: C. Primaquine

Explanation: Kills liver hypnozoites; test G6PD before use due to hemolysis risk.

CELL INJURY & DEATH

Q1. First cellular change in reversible injury:

- A. Pyknosis
- B. Cell membrane rupture
- C. Cellular swelling
- D. Karyorrhexis

Answer: C – Cellular swelling

Explanation: Due to **failure of Na^+/K^+ -ATPase**, leading to water influx.

Q2. Hallmark of irreversible cell injury:

- A. Cellular swelling
- B. Ribosomal detachment
- C. Mitochondrial vacuolization
- D. Nuclear fragmentation

Answer: D – Nuclear fragmentation (karyorrhexis)

Explanation: Nuclear changes like **pyknosis, karyorrhexis, karyolysis** indicate irreversible injury.

Q3. Most sensitive organelle to hypoxia:

- A. Nucleus
- B. Ribosomes
- C. Mitochondria
- D. Golgi apparatus

Answer: C – Mitochondria

Explanation: **Mitochondria fail early** due to dependency on oxidative phosphorylation.

Q4. Coagulative necrosis is typically seen in:

- A. Brain infarct
- B. Myocardial infarction
- C. Abscess
- D. Pancreatitis

Answer: B – Myocardial infarction

Explanation: **Coagulative necrosis** is caused by **ischemia in solid organs**, except brain.

Q5. Liquefactive necrosis is characteristic of:

- A. Kidney infarct
- B. Spleen infarct
- C. Brain infarct
- D. Liver cirrhosis

Answer: C – Brain infarct

Explanation: **Enzymatic digestion dominates** in brain → liquefactive necrosis.

Q6. Caseous necrosis is seen in:

- A. Fungal infection
- B. TB
- C. Stroke
- D. Burns

Answer: B – Tuberculosis

Explanation: Caseous = “cheese-like” necrosis, typical of **granulomatous TB**.

Q7. Fat necrosis is seen in:

- A. Appendicitis
- B. Pancreatitis

C. Stroke

D. Myocardial infarct

Answer: B – Pancreatitis

Explanation: Lipase releases fatty acids, which combine with $\text{Ca}^{2+} \rightarrow$ saponification.

Q8. Apoptosis is associated with:

A. Inflammation

B. ATP depletion

C. DNA fragmentation

D. Membrane rupture

Answer: C – DNA fragmentation

Explanation: Apoptosis = programmed cell death, involves nuclear condensation + DNA laddering.

Q9. Caspases are:

A. Kinases

B. Proteases

C. Phosphatases

D. Lipases

Answer: B – Proteases

Explanation: Caspases cleave intracellular proteins, orchestrating apoptosis.

Q10. Marker of apoptosis on gel electrophoresis:

A. Single band

B. DNA ladder

C. No bands

D. Protein smear

Answer: B – DNA ladder

Explanation: Endonucleases cleave DNA at internucleosomal regions, producing ladder pattern.

INFLAMMATION & WOUND HEALING

Q11. First cell to arrive in acute inflammation:

A. Macrophage

B. Lymphocyte

C. Neutrophil

D. Eosinophil

Answer: C – Neutrophil

Explanation: Neutrophils dominate early (6–24 hrs) in acute inflammation.

Q12. Hallmark of chronic inflammation:

A. Neutrophils

B. Macrophages and lymphocytes

C. Mast cells

D. Basophils

Answer: B – Macrophages and lymphocytes

Explanation: Chronic inflammation involves mononuclear cell infiltration and fibrosis.

Q13. Main mediator of vasodilation in inflammation:

A. IL-1

B. Bradykinin

C. Histamine

D. TNF- α

Answer: C – Histamine

Explanation: Histamine from mast cells causes early vasodilation.

Q14. Key chemotactic factor for neutrophils:

- A. IL-10
- B. TNF-alpha
- C. IL-8
- D. Bradykinin

Answer: C – IL-8

Explanation: IL-8, C5a, LTB4 are potent neutrophil attractants.

Q15. Pus formation is due to:

- A. Fibrosis
- B. Liquefactive necrosis
- C. Coagulative necrosis
- D. Granuloma

Answer: B – Liquefactive necrosis

Explanation: Accumulated neutrophils and enzymes digest tissue → pus.

Q16. Delayed wound healing in:

- A. Diabetes
- B. Smoking
- C. Steroid use
- D. All of the above

Answer: D – All of the above

Explanation: All impair collagen synthesis, vascular supply, or fibroblast activity.

Q17. Type of collagen in early wound healing (granulation tissue):

- A. Type I
- B. Type II
- C. Type III
- D. Type IV

Answer: C – Type III

Explanation: Type III collagen is laid first, later replaced by type I.

Q18. Granuloma formation requires:

- A. IL-1
- B. IL-8
- C. IFN-gamma
- D. TNF-beta

Answer: C – IFN-gamma

Explanation: Secreted by Th1 cells, activates macrophages into epithelioid cells.

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Q19. Epithelioid cells are modified:

- A. T-cells
- B. B-cells
- C. Macrophages
- D. Neutrophils

Answer: C – Macrophages

Explanation: They form granulomas in chronic inflammation.

Q20. Langhans giant cells contain:

- A. Central nuclei
- B. Peripheral nuclei in horseshoe shape
- C. Multilobulated nuclei
- D. Binucleated nuclei only

Answer: B – Peripheral nuclei

Explanation: Characteristic of **granulomatous inflammation**, e.g., TB.

CELL ADAPTATION & NEOPLASIA

Q21. Metaplasia is:

- A. Malignant change
- B. Normal growth
- C. Reversible cell type change
- D. Cell death

Answer: C – Reversible change of one mature cell type to another

Explanation: Usually **adaptive**, e.g., squamous metaplasia in smokers.

Q22. Dysplasia differs from metaplasia by:

- A. Reversibility
- B. Cellular atypia
- C. Apoptosis
- D. Necrosis

Answer: B – Cellular atypia

Explanation: **Dysplasia = disordered growth + nuclear atypia**, may progress to carcinoma.

Q23. Most common type of cervical cancer:

- A. Adenocarcinoma
- B. Small cell carcinoma
- C. Squamous cell carcinoma
- D. Basal cell carcinoma

Answer: C – Squamous cell carcinoma

Explanation: Arises from **transformation zone**, HPV-related.

Q24. Proto-oncogene example:

- A. p53
- B. Rb
- C. Ras
- D. BRCA1

Answer: C – Ras

Explanation: **Ras promotes cell division**; mutation → oncogene.

Q25. Tumor suppressor gene:

- A. Ras
- B. Myc
- C. p53
- D. Her2/neu

Answer: C – p53

Explanation: **p53 halts cell cycle** for DNA repair; mutation → unchecked growth.

Q26. p53 gene is located on:

- A. Chromosome 13
- B. Chromosome 17
- C. Chromosome 21
- D. Chromosome X

Answer: B – Chromosome 17

Explanation: Mutation → **Li-Fraumeni syndrome**.

Q27. Hallmark of malignant tumor:

- A. Encapsulation
- B. Anaplasia

C. Uniform nuclei

D. Slow growth

Answer: B – Anaplasia

Explanation: Loss of differentiation, nuclear pleomorphism, mitoses.

Q28. Spread of sarcomas is mainly by:

A. Lymphatics

B. Hematogenous route

C. Direct invasion

D. Perineural spread

Answer: B – Hematogenous

Explanation: Carcinomas → lymphatics, sarcomas → blood.

Q29. Most common site of metastasis:

A. Brain

B. Lung

C. Bone

D. Liver

Answer: B – Lung

Explanation: Due to high blood flow and filtering capillary beds.

Q30. Carcinoma in situ is:

A. Invasive cancer

B. Benign tumor

C. Non-invasive full thickness dysplasia

D. Hyperplasia

Answer: C – Non-invasive full thickness dysplasia

Explanation: Basement membrane not breached.

NEOPLASIA (CONTINUED)

Q31. Grading of a tumor refers to:

A. Degree of spread

B. Degree of differentiation

C. Size of tumor

D. Site of origin

Answer: B – Degree of differentiation

Explanation: Grading = how abnormal the tumor cells look; higher grade = poor differentiation.

Q32. Staging of cancer involves all EXCEPT:

A. Tumor size

B. Degree of spread

C. Lymph node status

D. Cell morphology

Answer: D – Cell morphology

Explanation: Staging = TNM system; morphology is part of grading.

Q33. Which virus is associated with Burkitt lymphoma?

A. HPV

B. Hepatitis B

C. Epstein-Barr virus

D. HTLV-1

Answer: C – Epstein-Barr virus (EBV)

Explanation: EBV linked to Burkitt lymphoma, nasopharyngeal carcinoma, and others.

Q34. Oncogene associated with breast cancer:

- A. BRCA1
- B. Rb
- C. Her2/neu
- D. p53

Answer: C – Her2/neu

Explanation: Overexpression of Her2/neu (ERBB2) in some breast cancers.

Q35. Tumor marker for hepatocellular carcinoma:

- A. CA-125
- B. PSA
- C. AFP
- D. CEA

Answer: C – Alpha-fetoprotein (AFP)

Explanation: ↑ AFP in HCC, yolk sac tumors, neural tube defects.

Q36. Tumor marker used in colon cancer:

- A. AFP
- B. CA-19-9
- C. CEA
- D. PSA

Answer: C – Carcinoembryonic antigen (CEA)

Explanation: Used to monitor recurrence, not diagnosis.

Q37. Tumor of chromaffin cells:

- A. Neuroblastoma
- B. Pheochromocytoma
- C. Ganglioneuroma
- D. Lymphoma

Answer: B – Pheochromocytoma

Explanation: Arises from adrenal medulla, secretes catecholamines.

Q38. Psammoma bodies are seen in all EXCEPT:

- A. Papillary thyroid carcinoma
- B. Meningioma
- C. Mesothelioma
- D. Follicular thyroid carcinoma

Answer: D – Follicular thyroid carcinoma

Explanation: Psammoma bodies = concentric calcifications, seen in "P-P-M-M" tumors.

Q39. A benign tumor of glandular origin:

- A. Carcinoma
- B. Adenoma
- C. Sarcoma
- D. Blastoma

Answer: B – Adenoma

Explanation: Adenoma = benign epithelial tumor of glandular origin.

Q40. Main mode of spread of carcinoma:

- A. Hematogenous
- B. Lymphatic
- C. Transcoelomic
- D. Perineural

Answer: B – Lymphatic

Explanation: Carcinomas spread via lymph, except renal cell and hepatocellular carcinoma.

HEMODYNAMIC DISORDERS & THROMBOSIS

Q41. Edema due to low oncotic pressure is seen in:

- A. Congestive heart failure
- B. Liver cirrhosis
- C. Inflammation
- D. Lymphatic blockage

Answer: B – Liver cirrhosis

Explanation: ↓ Albumin synthesis → ↓ plasma oncotic pressure → **edema**.

Q42. Virchow's triad includes all EXCEPT:

- A. Endothelial injury
- B. Abnormal blood flow
- C. Hypercoagulability
- D. Hypoxia

Answer: D – Hypoxia

Explanation: Virchow's triad = **3 risk factors for thrombosis**.

Q43. Most common site for arterial thrombi:

- A. Aorta
- B. Pulmonary artery
- C. Coronary artery
- D. Femoral vein

Answer: C – Coronary artery

Explanation: **Atherosclerosis predisposes to arterial thrombus**, esp. in coronary vessels.

Q44. Lines of Zahn indicate:

- A. Embolus
- B. Thrombus formed postmortem
- C. Antemortem thrombus
- D. Hemorrhage

Answer: C – Antemortem thrombus

Explanation: **Alternating pale and red lines indicate flowing blood during thrombus formation**.

Q45. Most common site of venous thrombus:

- A. Portal vein
- B. Hepatic vein
- C. Deep veins of leg
- D. Renal vein

Answer: C – Deep veins of leg

Explanation: **DVT in lower limbs** is most common source of pulmonary emboli.

Q46. Fat embolism typically follows:

- A. Long bone fracture
- B. Surgery
- C. Trauma to chest
- D. Burns

Answer: A – Long bone fracture

Explanation: **Fat globules from marrow enter bloodstream post-fracture**.

Q47. Saddle embolus lodges at:

- A. Femoral artery bifurcation
- B. Renal artery

C. Pulmonary artery bifurcation

D. Carotid bifurcation

Answer: C – Pulmonary artery bifurcation

Explanation: Large embolus blocks both pulmonary arteries, can cause sudden death.

Q48. Hemorrhagic infarct occurs in:

A. Solid organs

B. Brain

C. Lungs

D. Kidney

Answer: C – Lungs

Explanation: Dual blood supply → red infarct (also in liver, intestine).

Q49. Pale infarct is seen in:

A. Liver

B. Lung

C. Kidney

D. Intestine

Answer: C – Kidney

Explanation: End-arterial supply organs → white infarcts (heart, kidney, spleen).

Q50. Most common cause of DIC:

A. Sepsis

B. Trauma

C. Abruptio placenta

D. Snake bite

Answer: A – Sepsis

Explanation: Especially gram-negative endotoxins, lead to coagulopathy + bleeding.

AMYLOIDOSIS & IMMUNOPATHOLOGY (Q51–65)

Q51. Amyloid shows apple-green birefringence on:

A. H&E stain

B. PAS stain

C. Congo red stain under polarized light

D. Sudan black stain

Answer: C – Congo red under polarized light

Explanation: Classic test for amyloid fibrils.

Q52. Most common form of systemic amyloidosis:

A. AA

B. AL

C. A β ₂M

D. ATTR

Answer: B – AL

Explanation: AL (light chain) type from plasma cell dyscrasias like multiple myeloma.

Q53. AA amyloidosis is associated with:

A. TB

B. Multiple myeloma

C. Diabetes

D. Alzheimer's

Answer: A – TB

Explanation: Chronic inflammation (e.g. TB, RA) → AA type.

Q54. Amyloid in Alzheimer's disease is:

- A. AL
- B. AA
- C. A β
- D. ATTR

Answer: C – A β

Explanation: Derived from **amyloid precursor protein (APP)** in brain.

Q55. Most common site of amyloid deposition:

- A. Brain
- B. Kidney
- C. Heart
- D. Liver

Answer: B – Kidney

Explanation: Leads to **nephrotic syndrome**, especially in **glomeruli**.

Q56. Delayed type hypersensitivity is mediated by:

- A. IgE
- B. CD4+ T cells
- C. Mast cells
- D. Complement

Answer: B – CD4+ T cells

Explanation: Type IV hypersensitivity → **cytokine-mediated tissue injury**.

Q57. Example of Type II hypersensitivity:

- A. Serum sickness
- B. Tuberculosis
- C. Graves' disease
- D. Contact dermatitis

Answer: C – Graves' disease

Explanation: **Autoantibodies against TSH receptor** = type II.

Q58. Immune complex-mediated injury:

- A. Type I
- B. Type II
- C. Type III
- D. Type IV

Answer: C – Type III

Explanation: **Antigen-antibody complexes** activate complement (e.g., SLE).

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Q59. Most abundant antibody in serum:

- A. IgA
- B. IgG
- C. IgM
- D. IgE

Answer: B – IgG

Explanation: Provides **long-term immunity**, crosses **placenta**.

Q60. Antibody involved in mucosal immunity:

- A. IgM
- B. IgE
- C. IgA
- D. IgG

Answer: C – IgA

Explanation: Secretory IgA in tears, saliva, breast milk, gut.

Q61. Anaphylaxis is what type of hypersensitivity?

- A. I
- B. II
- C. III
- D. IV

Answer: A – Type I

Explanation: Mediated by IgE and histamine from mast cells.

Q62. Deficiency in DiGeorge syndrome:

- A. B cells
- B. Thymus and T cells
- C. Neutrophils
- D. Platelets

Answer: B – Thymus and T cells

Explanation: 22q11 deletion, no thymus → ↓ T cells.

Q63. Chediak-Higashi syndrome shows defect in:

- A. Microtubule function
- B. Ig production
- C. Complement
- D. Thymic development

Answer: A – Microtubule function

Explanation: Leads to giant lysosomes, albinism, infections.

Q64. Hyper-IgM syndrome is due to:

- A. CD40L mutation
- B. IgA deficiency
- C. C1 esterase defect
- D. BCR-ABL

Answer: A – CD40L mutation

Explanation: Failure of class switching → ↑ IgM, ↓ other antibodies.

Q65. Screening test for HIV:

- A. Western blot
- B. ELISA
- C. PCR
- D. Flow cytometry

Answer: B – ELISA

Explanation: ELISA = sensitive; confirmed by Western blot.

INFECTIOUS & VASCULAR PATHOLOGY (Q66–80)

Q66. CD4 count <200 is diagnostic of:

- A. HIV
- B. AIDS
- C. CMV
- D. EBV

Answer: B – AIDS

Explanation: WHO/CDC define AIDS at CD4 <200/mm³.

Q67. Most common cause of infective endocarditis overall:

- A. Staph aureus
- B. Strep viridans

C. Enterococcus

D. HACEK group

Answer: B – Strep viridans

Explanation: Seen in **subacute endocarditis**, especially post dental work.

Q68. Infective endocarditis in IV drug users:

A. Mitral valve

B. Tricuspid valve

C. Aortic valve

D. Pulmonic valve

Answer: B – Tricuspid valve

Explanation: **Right-sided valves** most affected in IV drug users.

Q69. Vegetations in Libman–Sacks endocarditis occur on:

A. One side only

B. Non-valvular tissue

C. Both sides of valve

D. Prosthetic valves

Answer: C – Both sides of valve

Explanation: Characteristic of **SLE-associated sterile vegetations**.

Q70. Most common cause of myocarditis:

A. Bacteria

B. Fungi

C. Coxsackie B virus

D. Trypanosoma

Answer: C – Coxsackie B virus

Explanation: Common cause of **viral myocarditis**, may lead to heart failure.

Q71. Onion-skinning in blood vessels is seen in:

A. Giant cell arteritis

B. Takayasu arteritis

C. Malignant hypertension

D. Atherosclerosis

Answer: C – Malignant hypertension

Explanation: **Hyperplastic arteriolosclerosis**, concentric laminations.

Q72. Temporal arteritis classically affects:

A. Children

B. Young females

C. Elderly

D. Adolescents

Answer: C – Elderly

Explanation: Giant cell arteritis → **headache, jaw claudication, visual loss**.

Q73. "Pulseless disease" refers to:

A. Buerger's disease

B. Takayasu arteritis

C. Kawasaki disease

D. Polyarteritis nodosa

Answer: B – Takayasu arteritis

Explanation: Involves **aortic arch branches**, seen in **young Asian females**.

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Q74. Polyarteritis nodosa spares:

- A. Kidney
- B. Heart
- C. Lungs
- D. Liver

Answer: C – Lungs

Explanation: PAN is lung-sparing, unlike other vasculitides.

Q75. Most common type of arteriosclerosis:

- A. Arteriolosclerosis
- B. Atherosclerosis
- C. Monckeberg sclerosis
- D. Giant cell arteritis

Answer: B – Atherosclerosis

Explanation: Affects large and medium-sized arteries, e.g. coronary, carotid.

Q76. Earliest lesion in atherosclerosis:

- A. Fatty streak
- B. Fibrous cap
- C. Plaque rupture
- D. Aneurysm

Answer: A – Fatty streak

Explanation: Seen even in children, consists of lipid-laden macrophages.

Q77. Most common aneurysm site:

- A. Thoracic aorta
- B. Abdominal aorta
- C. Femoral artery
- D. Circle of Willis

Answer: B – Abdominal aorta

Explanation: Below renal arteries, especially in smokers, atherosclerotic.

Q78. Berry aneurysms are seen in:

- A. Aorta
- B. Renal artery
- C. Circle of Willis
- D. Hepatic artery

Answer: C – Circle of Willis

Explanation: May rupture → subarachnoid hemorrhage.

Q79. Most common complication of MI within 1–3 days:

- A. Dressler's syndrome
- B. Arrhythmia
- C. Cardiac tamponade
- D. Pericarditis

Answer: B – Arrhythmia

Explanation: Lethal arrhythmias cause sudden cardiac death post-MI.

Q80. Dressler's syndrome is:

- A. Acute coronary syndrome
- B. Autoimmune pericarditis
- C. Renal failure
- D. Aneurysm rupture

Answer: B – Autoimmune pericarditis

Explanation: Occurs weeks after MI, autoantibodies against pericardial antigens.

SYSTEMIC PATHOLOGY: BEGINNING HEMATOLOGY (Q81–100)

Q81. Most common leukemia in children:

- A. AML
- B. CML
- C. CLL
- D. ALL

Answer: D – Acute Lymphoblastic Leukemia (ALL)

Explanation: Peaks at age 3–5 years, excellent prognosis in children.

Q82. Auer rods are seen in:

- A. CML
- B. AML
- C. CLL
- D. ALL

Answer: B – AML

Explanation: Needle-like inclusions in myeloblasts; typical of acute promyelocytic leukemia (M3).

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Q83. t(15;17) translocation is seen in:

- A. CML
- B. AML–M3
- C. CLL
- D. ALL

Answer: B – AML–M3 (Acute Promyelocytic Leukemia)

Explanation: Treated with all-trans retinoic acid (ATRA).

Q84. Philadelphia chromosome:

- A. t(9;22)
- B. t(8;14)
- C. t(15;17)
- D. t(14;18)

Answer: A – t(9;22)

Explanation: Seen in CML and some ALL, BCR–ABL fusion gene.

Q85. Smudge cells on blood smear:

- A. AML
- B. CLL
- C. CML
- D. ALL

Answer: B – CLL

Explanation: Fragile lymphocytes, most common adult leukemia.

Q86. Rouleaux formation is seen in:

- A. Leukemia
- B. Myeloma
- C. Lymphoma
- D. ITP

Answer: B – Multiple Myeloma

Explanation: Stacked RBCs due to ↑ serum proteins (Ig).

Q87. Bence–Jones proteins are:

- A. Light chains in urine
- B. Heavy chains in plasma
- C. Hemoglobin fragments

D. M proteins

Answer: A – Light chains in urine

Explanation: Seen in **multiple myeloma**, nephrotoxic.

Q88. Starry-sky appearance in histology:

- A. Follicular lymphoma
- B. Burkitt lymphoma
- C. Hodgkin disease
- D. Myeloma

Answer: B – Burkitt lymphoma

Explanation: **Macrophages** among sheets of B-cells create starry appearance.

Q89. Reed-Sternberg cells seen in:

- A. Non-Hodgkin lymphoma
- B. Myeloma
- C. Hodgkin lymphoma
- D. ALL

Answer: C – Hodgkin lymphoma

Explanation: Large **binucleated cells** with "owl eye" appearance.

Q90. Most common Hodgkin lymphoma:

- A. Lymphocyte rich
- B. Mixed cellularity
- C. Nodular sclerosis
- D. Lymphocyte depleted

Answer: C – Nodular sclerosis

Explanation: Affects **young women**, best prognosis.

Q91. Spleen is largest in:

- A. CLL
- B. CML
- C. AML
- D. ALL

Answer: B – CML

Explanation: Can reach **massive splenomegaly** in chronic phase.

Q92. "Teardrop" RBCs seen in:

- A. Thalassemia
- B. Myelofibrosis
- C. Iron deficiency
- D. G6PD

Answer: B – Myelofibrosis

Explanation: **Fibrotic marrow squeezes RBCs** → dacrocytes.

Q93. Reed-Sternberg cell origin:

- A. T-cell
- B. NK cell
- C. B-cell
- D. Plasma cell

Answer: C – B-cell

Explanation: From **germinal center B-cells**, despite atypical appearance.

Q94. t(14;18) translocation:

- A. Follicular lymphoma

B. Burkitt lymphoma

C. AML

D. CLL

Answer: A – Follicular lymphoma

Explanation: Overexpression of **Bcl-2** → prevents apoptosis.

Q95. CD markers for B-cells:

A. CD3, CD8

B. CD4, CD25

C. CD19, CD20

D. CD5, CD7

Answer: C – CD19, CD20

Explanation: Classic markers for **B lymphocytes**.

Q96. CD marker for Reed–Sternberg cell:

A. CD15 & CD30

B. CD10 & CD20

C. CD3 & CD7

D. CD5 & CD23

Answer: A – CD15 and CD30

Explanation: Seen in **classical Hodgkin lymphoma**.

Q97. TRAP positivity is diagnostic for:

A. CLL

B. AML

C. Hairy cell leukemia

D. Follicular lymphoma

Answer: C – Hairy cell leukemia

Explanation: Cells stain with **Tartrate-resistant acid phosphatase**.

Q98. Heinz bodies are seen in:

A. Sick cell

B. G6PD deficiency

C. Thalassemia

D. Spherocytosis

Answer: B – G6PD deficiency

Explanation: **Oxidized Hb precipitates**, removed by splenic macrophages.

Q99. Most common childhood malignancy:

A. ALL

B. Neuroblastoma

C. Medulloblastoma

D. Wilms tumor

Answer: A – ALL

Explanation: Acute lymphoblastic leukemia is the **most frequent pediatric cancer**.

Q100. Hypersegmented neutrophils seen in:

A. Iron deficiency

B. Sick cell

C. Megaloblastic anemia

D. Hemolytic anemia

Answer: C – Megaloblastic anemia

Explanation: Due to **B12 or folate deficiency**, affects DNA synthesis.

ANEMIAS, RBC DISORDERS & COAGULATION (Q101–120)

Q101. Most common cause of iron deficiency anemia worldwide:

- A. Dietary deficiency
- B. Hookworm infestation
- C. Blood donation
- D. Malabsorption

Answer: B – Hookworm infestation

Explanation: Blood loss from **parasites** (e.g., *Ancylostoma*) is a major global cause.

Q102. Peripheral smear in iron deficiency anemia shows:

- A. Macrocytic, normochromic cells
- B. Microcytic, hypochromic cells
- C. Normocytic, normochromic cells
- D. Target cells

Answer: B – Microcytic, hypochromic cells

Explanation: Due to **decreased hemoglobin synthesis**.

Q103. Koilonychia is seen in:

- A. Vitamin B12 deficiency
- B. Iron deficiency anemia
- C. Sideroblastic anemia
- D. Hemolytic anemia

Answer: B – Iron deficiency anemia

Explanation: Spoon-shaped nails (koilonychia) are a **classical feature**.

Q104. Best test to detect iron deficiency in early stage:

- A. Serum ferritin
- B. Serum iron
- C. TIBC
- D. Hemoglobin

Answer: A – Serum ferritin

Explanation: **Ferritin drops first** before Hb or serum iron in iron deficiency.

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Q105. Vitamin B12 is absorbed in:

- A. Duodenum
- B. Jejunum
- C. Ileum
- D. Colon

Answer: C – Ileum

Explanation: Requires **intrinsic factor** from stomach and is absorbed in **terminal ileum**.

Q106. Hypersegmented neutrophils are a feature of:

- A. Iron deficiency
- B. Sideroblastic anemia
- C. Thalassemia
- D. Megaloblastic anemia

Answer: D – Megaloblastic anemia

Explanation: **Impaired DNA synthesis** → nuclear maturation delay.

Q107. Intrinsic factor is secreted by:

- A. Chief cells
- B. Mucous cells
- C. Parietal cells
- D. Enterocytes

Answer: C – Parietal cells

Explanation: Essential for vitamin B12 absorption.

Q108. Sickle cell anemia is caused by:

- A. Deletion mutation
- B. Frameshift mutation
- C. Missense mutation
- D. Nonsense mutation

Answer: C – Missense mutation

Explanation: Valine replaces glutamic acid in β -chain of Hb.

Q109. Sickle cell crises are precipitated by all EXCEPT:

- A. Infection
- B. Dehydration
- C. High oxygen tension
- D. Acidosis

Answer: C – High oxygen tension

Explanation: Sickle shape is stabilized by hypoxia, dehydration, acidosis.

Q110. Thalassemia major requires:

- A. Iron therapy
- B. Vitamin B12 therapy
- C. Lifelong blood transfusions
- D. Phlebotomy

Answer: C – Lifelong blood transfusions

Explanation: To maintain Hb; risk of iron overload.

Q111. Target cells are seen in all EXCEPT:

- A. Thalassemia
- B. Liver disease
- C. Sickle cell disease
- D. Iron deficiency anemia

Answer: D – Iron deficiency anemia

Explanation: Target cells appear in liver disease, Hb disorders.

Q112. Basophilic stippling is seen in:

- A. Iron deficiency
- B. Lead poisoning
- C. B12 deficiency
- D. Hemolysis

Answer: B – Lead poisoning

Explanation: Due to ribosomal RNA aggregates.

Q113. Heinz bodies indicate:

- A. G6PD deficiency
- B. Sideroblastic anemia
- C. Iron deficiency
- D. Spherocytosis

Answer: A – G6PD deficiency

Explanation: Precipitated denatured hemoglobin.

Q114. Hereditary spherocytosis has deficiency of:

- A. Spectrin
- B. Hemoglobin

C. Globin chain

D. Catalase

Answer: A – Spectrin

Explanation: RBC membrane protein defect → spherical cells, hemolysis.

Q115. Increased osmotic fragility is seen in:

A. Thalassemia

B. Iron deficiency

C. Sickle cell anemia

D. Hereditary spherocytosis

Answer: D – Hereditary spherocytosis

Explanation: Fragile RBCs rupture easily in hypotonic solution.

Q116. Coombs test is positive in:

A. Hereditary spherocytosis

B. Iron deficiency

C. Autoimmune hemolytic anemia

D. Thalassemia

Answer: C – Autoimmune hemolytic anemia

Explanation: Detects antibodies on RBC surface.

Q117. Schistocytes are seen in:

A. Hemolytic uremic syndrome

B. Thalassemia

C. Megaloblastic anemia

D. Aplastic anemia

Answer: A – HUS

Explanation: Fragmented RBCs from microangiopathic hemolysis.

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Q118. Pancytopenia with hypocellular marrow suggests:

A. Leukemia

B. Myelofibrosis

C. Aplastic anemia

D. Hemolytic anemia

Answer: C – Aplastic anemia

Explanation: Suppressed hematopoiesis → all lineages ↓.

Q119. Aplastic anemia is NOT caused by:

A. Chloramphenicol

B. Radiation

C. Benzene

D. Erythropoietin

Answer: D – Erythropoietin

Explanation: EPO stimulates marrow; others are toxic.

Q120. Primary hemostasis involves:

A. Fibrin clot formation

B. Platelet adhesion and aggregation

C. Thrombin activation

D. Coagulation cascade

Answer: B – Platelet adhesion and aggregation

Explanation: First step in clotting; involves platelet plug formation.

BLEEDING DISORDERS & COAGULATION (Q121–135)

Q121. vWF disease shows defect in:

- A. Platelet count
- B. Platelet function
- C. PT
- D. Platelet morphology

Answer: B – Platelet function

Explanation: vWF binds platelets to **collagen**, also stabilizes **Factor VIII**.

Q122. Isolated prolonged PTT with normal PT and bleeding:

- A. Hemophilia A
- B. ITP
- C. DIC
- D. Liver disease

Answer: A – Hemophilia A

Explanation: **Factor VIII deficiency**, X-linked.

Q123. Bernard–Soulier syndrome involves defect in:

- A. GpIIb/IIIa
- B. GpIb
- C. Fibrinogen
- D. Factor V

Answer: B – GpIb

Explanation: Defective **platelet adhesion to vWF**.

Q124. Glanzmann thrombasthenia is due to:

- A. GpIb deficiency
- B. vWF defect
- C. GpIIb/IIIa deficiency
- D. Factor XIII deficiency

Answer: C – GpIIb/IIIa deficiency

Explanation: Impaired **platelet aggregation**, normal platelet count.

Q125. Common feature of DIC:

- A. High platelet count
- B. High fibrinogen
- C. Elevated D-dimers
- D. Decreased PT

Answer: C – Elevated D-dimers

Explanation: DIC = **coagulation + fibrinolysis** → ↑ **D-dimers**, bleeding.

Q126. ITP is due to:

- A. Platelet destruction by autoantibodies
- B. Bone marrow suppression
- C. Platelet underproduction
- D. Vitamin K deficiency

Answer: A – Platelet destruction by autoantibodies

Explanation: Anti-GpIIb/IIIa antibodies → **platelet clearance by spleen**.

Q127. Hemophilia A treatment:

- A. Vitamin K
- B. Platelet transfusion
- C. Factor IX
- D. Factor VIII

Answer: D – Factor VIII

Explanation: Factor VIII concentrate replaces the deficiency.

Q128. Most sensitive test for DIC:

- A. PT
- B. Platelet count
- C. D-dimer
- D. BT

Answer: C – D-dimer

Explanation: Reflects ongoing fibrinolysis, elevated in DIC.

Q129. PT measures:

- A. Intrinsic pathway
- B. Extrinsic pathway
- C. Platelet function
- D. Fibrinolysis

Answer: B – Extrinsic pathway

Explanation: Includes Factor VII, used to monitor warfarin.

Q130. PTT measures:

- A. Factor VII
- B. Intrinsic pathway
- C. Platelet count
- D. Fibrinolysis

Answer: B – Intrinsic pathway

Explanation: Includes Factors VIII, IX, XI, XII, used for heparin monitoring.

Q131. Bleeding time is prolonged in:

- A. Hemophilia A
- B. Warfarin therapy
- C. Platelet disorders
- D. Vitamin K deficiency

Answer: C – Platelet disorders

Explanation: BT reflects platelet plug formation.

Q132. Vitamin K is required for synthesis of:

- A. Factor I, II, III
- B. Factors II, VII, IX, X
- C. Factors V, VIII, XIII
- D. Platelets

Answer: B – II, VII, IX, X

Explanation: Also needed for Proteins C and S.

Q133. Warfarin inhibits:

- A. Factor VIII
- B. Platelets
- C. Vitamin K epoxide reductase
- D. Thrombin

Answer: C – Vitamin K epoxide reductase

Explanation: Prevents activation of vitamin K-dependent factors.

Q134. Heparin acts by activating:

- A. Thrombin
- B. Protein C
- C. Antithrombin III

D. Fibrinolysin

Answer: C – Antithrombin III

Explanation: Inhibits Factors IIa and Xa.

Q135. Mixing study corrects PTT in:

- A. Lupus anticoagulant
- B. Hemophilia
- C. DIC
- D. Antiphospholipid syndrome

Answer: B – Hemophilia

Explanation: Factor deficiency corrects with normal plasma; inhibitors do not.

MISCELLANEOUS PATHOLOGY (Q136–150)

Q136. Hyperplasia is:

- A. Increase in cell size
- B. Increase in cell number
- C. Decrease in size
- D. Abnormal shape

Answer: B – Increase in cell number

Explanation: E.g., endometrial hyperplasia, prostate hyperplasia.

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Q137. Hypertrophy example:

- A. Endometrial thickening
- B. Prostatic enlargement
- C. Uterine growth in pregnancy
- D. Metaplasia

Answer: C – Uterine growth in pregnancy

Explanation: Due to hormonal stimulation → cell size increase.

Q138. Atrophy occurs due to all EXCEPT:

- A. Disuse
- B. Denervation
- C. Increased workload
- D. Ischemia

Answer: C – Increased workload

Explanation: Increased workload → hypertrophy, not atrophy.

Q139. Metaplasia is reversible if:

- A. Genetic mutation occurs
- B. Stimulus is removed
- C. Invasion occurs
- D. Cell death occurs

Answer: B – Stimulus is removed

Explanation: E.g., cessation of smoking reverses bronchial metaplasia.

Q140. Psammoma bodies are NOT seen in:

- A. Papillary thyroid carcinoma
- B. Serous ovarian carcinoma
- C. Medullary thyroid carcinoma
- D. Meningioma

Answer: C – Medullary thyroid carcinoma

Explanation: Seen in "P-P-M-M" tumors – Papillary, PSAMMOMA, Meningioma, Mesothelioma.

Q141. Reed–Sternberg cells are:

- A. CD15⁺/CD30⁺
- B. CD20⁺
- C. CD3⁺
- D. CD5⁺

Answer: A – CD15 and CD30

Explanation: Classic Hodgkin lymphoma marker profile.

Q142. Commonest cause of anemia in hospitalized patients:

- A. Iron deficiency
- B. Chronic disease
- C. B12 deficiency
- D. Aplastic anemia

Answer: B – Anemia of chronic disease

Explanation: Due to inflammatory cytokines suppressing erythropoiesis.

Q143. Best marker for early iron deficiency:

- A. Hemoglobin
- B. Serum iron
- C. Ferritin
- D. Transferrin saturation

Answer: C – Ferritin

Explanation: Drops early; low ferritin = iron deficiency.

Q144. Howell–Jolly bodies are seen in:

- A. Hemolytic anemia
- B. Megaloblastic anemia
- C. Post-splenectomy
- D. Leukemia

Answer: C – Post-splenectomy

Explanation: Nuclear remnants normally removed by spleen.

Q145. HbH disease is:

- A. β -thalassemia major
- B. α -thalassemia (3 gene deletion)
- C. G6PD deficiency
- D. Sickle cell anemia

Answer: B – Alpha thalassemia (3 gene deletion)

Explanation: HbH = β^4 tetramers.

Q146. RBCs clumped on peripheral smear suggest:

- A. Cold agglutinin disease
- B. Warm AIHA
- C. Iron deficiency
- D. Malaria

Answer: A – Cold agglutinin disease

Explanation: IgM-mediated hemolysis, seen with Mycoplasma.

Q147. Reticulocyte count increases in:

- A. Iron deficiency
- B. Aplastic anemia
- C. Hemolytic anemia
- D. B12 deficiency

Answer: C – Hemolytic anemia

Explanation: Marrow compensates with reticulocytosis.

Q148. Punched-out lesions on skull x-ray suggest:

- A. Osteoporosis
- B. Paget's disease
- C. Multiple myeloma
- D. Lymphoma

Answer: C – Multiple myeloma

Explanation: Due to **osteolytic bone destruction**.

Q149. Which anemia has high MCHC?

- A. Iron deficiency
- B. Thalassemia
- C. Sickle cell
- D. Hereditary spherocytosis

Answer: D – Hereditary spherocytosis

Explanation: Due to **cell dehydration and membrane loss**.

Q150. Target cells are caused by:

- A. Increased membrane
- B. Decreased hemoglobin
- C. Both
- D. Neither

Answer: C – Both

Explanation: Seen in **thalassemia, liver disease**, due to membrane excess or Hb reduction.

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Q151. What is the best test to confirm autoimmune hemolytic anemia?

- A. Coombs test (Direct)
- B. Osmotic fragility test
- C. Reticulocyte count
- D. Hemoglobin electrophoresis

Correct Answer: A. Coombs test (Direct)

Explanation: Direct Coombs detects IgG or complement on RBCs, confirming autoimmune hemolysis.

Q152. Howell-Jolly bodies are seen in which condition?

- A. Iron deficiency anemia
- B. Sickle cell anemia
- C. G6PD deficiency
- D. Folate deficiency

Correct Answer: B. Sickle cell anemia

Explanation: Due to splenic dysfunction or autosplenectomy, nuclear remnants (Howell-Jolly bodies) persist in RBCs.

Q153. Teardrop-shaped RBCs (dacrocytes) are most characteristic of:

- A. Thalassemia
- B. Myelofibrosis
- C. Hereditary spherocytosis
- D. Sickle cell anemia

Correct Answer: B. Myelofibrosis

Explanation: Bone marrow fibrosis deforms developing RBCs, producing teardrop shapes.

Q154. What is the most common cause of normocytic anemia in hospitalized patients?

- A. Acute blood loss
- B. Iron deficiency anemia
- C. Anemia of chronic disease

D. Hemolysis

Correct Answer: C. Anemia of chronic disease

Explanation: Inflammatory cytokines impair iron utilization and erythropoietin response.

Q155. Which of the following iron study profiles matches anemia of chronic disease?

A. ↑ Iron, ↓ TIBC

B. ↓ Ferritin

C. ↓ Iron, ↓ TIBC, ↑ Ferritin

D. ↑ TIBC, ↑ Iron

Correct Answer: C. ↓ Iron, ↓ TIBC, ↑ Ferritin

Explanation: Iron is trapped in storage, TIBC is low, and ferritin is high due to inflammation.

Q156. G6PD deficiency is inherited as:

A. Autosomal dominant

B. Autosomal recessive

C. X-linked recessive

D. Mitochondrial

Correct Answer: C. X-linked recessive

Explanation: Males are primarily affected; enzyme protects RBCs from oxidative damage.

Q157. Bite cells are typically seen in:

A. Sickle cell anemia

B. G6PD deficiency

C. Thalassemia

D. Megaloblastic anemia

Correct Answer: B. G6PD deficiency

Explanation: Denatured hemoglobin (Heinz bodies) removed by splenic macrophages causes "bite" appearance.

Q158. Pappenheimer bodies represent:

A. Ribosomal RNA

B. Iron granules

C. Hemoglobin

D. Mitochondria

Correct Answer: B. Iron granules

Explanation: These are residual iron-containing granules, seen in sideroblastic anemia or post-splenectomy.

Q159. A macrocytic anemia with neurological symptoms suggests:

A. Iron deficiency anemia

B. Folate deficiency

C. Vitamin B12 deficiency

D. Sideroblastic anemia

Correct Answer: C. Vitamin B12 deficiency

Explanation: B12 deficiency causes demyelination of the dorsal columns and lateral corticospinal tracts.

Q160. Which drug is a well-known cause of aplastic anemia?

A. Ciprofloxacin

B. Chloramphenicol

C. Paracetamol

D. Metformin

Correct Answer: B. Chloramphenicol

Explanation: Rare but classic cause of dose-independent bone marrow suppression.

Q161. Pancytopenia with a hypercellular bone marrow is seen in:

- A. Aplastic anemia
- B. Leukemia
- C. Myelodysplastic syndrome
- D. Hemolytic anemia

Correct Answer: C. Myelodysplastic syndrome

Explanation: Ineffective hematopoiesis leads to peripheral pancytopenia despite marrow hypercellularity.

Q162. Philadelphia chromosome is associated with:

- A. AML
- B. CML
- C. CLL
- D. ALL

Correct Answer: B. CML

Explanation: t(9;22) BCR-ABL translocation causes constitutive tyrosine kinase activity.

Q163. The t(8;14) translocation is seen in:

- A. Follicular lymphoma
- B. Burkitt lymphoma
- C. Hodgkin lymphoma
- D. Multiple myeloma

Correct Answer: B. Burkitt lymphoma

Explanation: Leads to MYC overexpression and highly proliferative tumor.

Q164. "Smudge cells" on blood smear are found in:

- A. CML
- B. AML
- C. CLL
- D. ALL

Correct Answer: C. CLL

Explanation: Fragile lymphocytes rupture during smear preparation.

Q165. The most common leukemia in adults is:

- A. AML
- B. CML
- C. CLL
- D. ALL

Correct Answer: C. CLL

Explanation: Seen in elderly; often an incidental finding.

Q166. CD19 and CD20 are surface markers of:

- A. T cells
- B. B cells
- C. Plasma cells
- D. NK cells

Correct Answer: B. B cells

Explanation: Found on most stages of B cell development except plasma cells.

Q167. TRAP positivity is diagnostic of:

- A. AML
- B. Hairy cell leukemia
- C. Follicular lymphoma
- D. Hodgkin lymphoma

Correct Answer: B. Hairy cell leukemia

Explanation: Tartrate-resistant acid phosphatase is a key diagnostic marker.

Q168. A common complication of multiple myeloma is:

- A. Leukocytosis
- B. Hypercalcemia
- C. Polycythemia
- D. Hypokalemia

Correct Answer: B. Hypercalcemia

Explanation: Due to osteolytic bone lesions from plasma cell activity.

Q169. The best screening test for multiple myeloma is:

- A. Serum calcium
- B. Serum protein electrophoresis
- C. CBC
- D. Bone marrow biopsy

Correct Answer: B. Serum protein electrophoresis

Explanation: Detects the M-spike from monoclonal immunoglobulin production.

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Q170. Bence-Jones proteins in urine are:

- A. Heavy chains
- B. Light chains
- C. Beta-globulins
- D. Albumin

Correct Answer: B. Light chains

Explanation: Seen in multiple myeloma; nephrotoxic.

Q171. Most common transfusion reaction is:

- A. Febrile non-hemolytic
- B. Anaphylactic
- C. Hemolytic
- D. TRALI

Correct Answer: A. Febrile non-hemolytic

Explanation: Caused by cytokines from donor leukocytes.

Q172. TRALI is caused by:

- A. Alloantibodies to RBC antigens
- B. Bacterial contamination
- C. Donor anti-leukocyte antibodies
- D. IgA deficiency

Correct Answer: C. Donor anti-leukocyte antibodies

Explanation: Leads to neutrophil activation and pulmonary capillary leakage.

Q173. Anaphylaxis following blood transfusion is seen in:

- A. IgM deficiency
- B. TTP
- C. IgA deficiency
- D. Hemophilia

Correct Answer: C. IgA deficiency

Explanation: Anti-IgA antibodies react to donor plasma.

Q174. Universal donor blood group (RBCs):

- A. AB+
- B. O-
- C. A-

D. O+

Correct Answer: B. O-

Explanation: No A, B, or Rh antigens on RBCs.

Q175. Most immunogenic Rh antigen is:

A. C

B. D

C. E

D. e

Correct Answer: B. D

Explanation: Responsible for most Rh incompatibility cases.

Q176. HLA Class I molecules are found on:

A. RBCs only

B. B cells only

C. All nucleated cells

D. Only antigen-presenting cells

Correct Answer: C. All nucleated cells

Explanation: Present endogenous antigens to CD8⁺ T cells.

Q177. Hyperacute transplant rejection is mediated by:

A. T cells

B. NK cells

C. Preformed antibodies

D. Dendritic cells

Correct Answer: C. Preformed antibodies

Explanation: Occurs within minutes due to ABO or HLA incompatibility.

Q178. Graft-versus-host disease (GVHD) is most associated with:

A. Platelet transfusion

B. Bone marrow transplant

C. Liver transplant

D. Kidney transplant

Correct Answer: B. Bone marrow transplant

Explanation: Donor T-cells attack host tissues.

Q179. Type III hypersensitivity involves:

A. IgE

B. Complement activation by immune complexes

C. CD8 T cells

D. Mast cell degranulation

Correct Answer: B. Complement activation by immune complexes

Explanation: Seen in SLE, serum sickness, and post-streptococcal GN.

Q180. Example of Type IV hypersensitivity:

A. Asthma

B. SLE

C. Contact dermatitis

D. Myasthenia gravis

Correct Answer: C. Contact dermatitis

Explanation: T-cell mediated delayed reaction.

Q181. Anti-dsDNA antibody is specific for:

A. SLE

- B. RA
- C. Sjogren syndrome
- D. Scleroderma

Correct Answer: A. SLE

Explanation: Also correlates with disease activity and nephritis.

Q182. HLA-B27 is associated with:

- A. SLE
- B. Psoriasis
- C. Ankylosing spondylitis
- D. Goodpasture's

Correct Answer: C. Ankylosing spondylitis

Explanation: Also linked to reactive arthritis and IBD-related arthritis.

Q183. ANA positivity is seen in:

- A. SLE
- B. RA
- C. Sjogren syndrome
- D. All of the above

Correct Answer: D. All of the above

Explanation: ANA is sensitive but non-specific for autoimmune disorders.

Q184. CREST syndrome is a limited form of:

- A. SLE
- B. RA
- C. Scleroderma
- D. Sjogren syndrome

Correct Answer: C. Scleroderma

Explanation: C–Calcinosis, R–Raynaud, E–Esophageal dysmotility, S–Sclerodactyly, T–Telangiectasia.

Q185. Rheumatoid factor targets:

- A. DNA
- B. IgM
- C. IgG Fc region
- D. T-cell receptor

Correct Answer: C. IgG Fc region

Explanation: RF is an IgM antibody against IgG.

Q186. P-ANCA is seen in:

- A. Wegener's granulomatosis
- B. Microscopic polyangiitis
- C. SLE
- D. Polyarteritis nodosa

Correct Answer: B. Microscopic polyangiitis

Explanation: P-ANCA (MPO antibodies) also seen in eosinophilic GPA.

Q187. C-ANCA is associated with:

- A. Polyarteritis nodosa
- B. Microscopic polyangiitis
- C. GPA (Wegener's)
- D. SLE

Correct Answer: C. GPA (Wegener's granulomatosis)

Explanation: C-ANCA targets proteinase-3.

Q188. Hallmark of nephrotic syndrome:

- A. Hematuria
- B. Proteinuria >3.5 g/day
- C. RBC casts
- D. Hypertension

Correct Answer: B. Proteinuria >3.5 g/day

Explanation: Also includes hypoalbuminemia, edema, hyperlipidemia.

Q189. Most common nephrotic syndrome in adults:

- A. Minimal change disease
- B. FSGS
- C. Membranous nephropathy
- D. IgA nephropathy

Correct Answer: C. Membranous nephropathy

Explanation: Associated with autoimmunity and solid tumors.

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Q190. Glomerular crescents are seen in:

- A. Minimal change disease
- B. RPGN
- C. Diabetic nephropathy
- D. Membranous GN

Correct Answer: B. RPGN

Explanation: Represents severe glomerular injury.

Q191. Goodpasture's syndrome affects:

- A. Brain and retina
- B. Liver and pancreas
- C. Lung and kidney
- D. Heart and muscle

Correct Answer: C. Lung and kidney

Explanation: Autoantibodies target basement membrane (anti-GBM).

Q192. Most common cause of acute tubular necrosis:

- A. Drug toxicity
- B. Infection
- C. Ischemia
- D. Obstruction

Correct Answer: C. Ischemia

Explanation: Especially in shock or hypotension.

Q193. Hyaline arteriosclerosis is classically seen in:

- A. Malignant hypertension
- B. Diabetes and benign hypertension
- C. Amyloidosis
- D. SLE

Correct Answer: B. Diabetes and benign hypertension

Explanation: Results from plasma protein leakage into vessel walls.

Q194. Kimmelstiel-Wilson nodules are pathognomonic of:

- A. Minimal change disease
- B. Diabetic nephropathy
- C. Lupus nephritis
- D. FSGS

Correct Answer: B. Diabetic nephropathy

Explanation: Nodular glomerulosclerosis due to advanced glycation.

Q195. Most common site for metastatic calcification:

- A. Brain
- B. Liver
- C. Kidney
- D. Skin

Correct Answer: C. Kidney

Explanation: Alkaline pH promotes calcium deposition in renal tubules.

Q196. Dystrophic calcification occurs in:

- A. Normal tissue
- B. Necrotic tissue
- C. Neoplastic tissue
- D. Fat

Correct Answer: B. Necrotic tissue

Explanation: Occurs despite normal serum calcium levels.

Q197. Fatty change in the liver is seen in:

- A. Alcoholism
- B. Obesity
- C. Starvation
- D. All of the above

Correct Answer: D. All of the above

Explanation: Caused by impaired lipid metabolism.

Q198. Councilman bodies represent:

- A. Bile plugs
- B. Apoptotic hepatocytes
- C. Mallory hyaline
- D. Viral inclusions

Correct Answer: B. Apoptotic hepatocytes

Explanation: Seen in viral hepatitis and yellow fever.

Q199. "Nutmeg liver" is a sign of:

- A. Cirrhosis
- B. Hemochromatosis
- C. Congestive hepatopathy
- D. Viral hepatitis

Correct Answer: C. Congestive hepatopathy

Explanation: Due to chronic right-sided heart failure.

Q200. Mallory bodies in hepatocytes are composed of:

- A. Fat droplets
- B. Cytokeratin filaments
- C. Amyloid
- D. Glycogen

Correct Answer: B. Cytokeratin filaments

Explanation: Eosinophilic inclusions seen in alcoholic liver disease.

These cover **gross anatomy, neuroanatomy, and surface anatomy**.

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Q1. Surgical neck fracture of humerus injures which nerve?

- A. Radial
- B. Axillary
- C. Ulnar
- D. Musculocutaneous

Answer: B

Explanation: The axillary nerve winds around the surgical neck of the humerus. Injury leads to deltoid paralysis and loss of shoulder abduction beyond 15°.

Q2. Which artery runs in the anatomical snuffbox?

- A. Ulnar artery
- B. Radial artery
- C. Brachial artery
- D. Deep palmar arch

Answer: B

Explanation: The radial artery passes through the anatomical snuffbox, superficial to the scaphoid and trapezium.

Q3. Which structure passes through foramen spinosum?

- A. Middle meningeal artery
- B. Internal carotid artery
- C. Mandibular nerve
- D. Facial nerve

Answer: A

Explanation: Foramen spinosum transmits the middle meningeal artery and the meningeal branch of the mandibular nerve.

Q4. The strongest ligament in the body is:

- A. Ischiofemoral ligament
- B. Pubofemoral ligament
- C. Iliofemoral ligament
- D. Ligamentum teres

Answer: C

Explanation: The iliofemoral ligament prevents hyperextension of the hip and is the strongest ligament in the human body.

Q5. Which muscle is **not** innervated by the median nerve?

- A. Pronator teres
- B. Palmaris longus
- C. Flexor carpi radialis
- D. Flexor carpi ulnaris

Answer: D

Explanation: Flexor carpi ulnaris is supplied by the **ulnar nerve**, not the median.

Q6. Popliteal artery is a continuation of:

- A. External iliac
- B. Femoral
- C. Deep femoral
- D. Tibial artery

Answer: B

Explanation: The femoral artery becomes the popliteal artery after passing through the adductor hiatus.

Q7. The lateral plantar nerve is a branch of:

- A. Deep peroneal nerve
- B. Tibial nerve
- C. Sural nerve
- D. Femoral nerve

Answer: B

Explanation: The tibial nerve divides into the medial and lateral plantar nerves after entering the foot.

Q8. The adult spinal cord ends at which vertebral level?

- A. L1–L2
- B. L3–L4
- C. S1
- D. T12

Answer: A

Explanation: The spinal cord typically ends at the level of the **L1–L2 intervertebral disc** in adults.

Q9. The median nerve enters the hand through the:

- A. Ulnar canal
- B. Carpal tunnel
- C. Guyon's canal
- D. Radial fossa

Answer: B

Explanation: The median nerve enters the palm via the carpal tunnel beneath the flexor retinaculum.

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Q10. All are contents of the cubital fossa except:

- A. Median nerve
- B. Brachial artery
- C. Biceps tendon
- D. Ulnar nerve

Answer: D

Explanation: The ulnar nerve passes posterior to the medial epicondyle and is **not** a content of the cubital fossa.

Q11. Which nerve is responsible for the “wrist drop” deformity?

- A. Radial
- B. Ulnar
- C. Median
- D. Musculocutaneous

Answer: A

Explanation: Radial nerve injury leads to paralysis of wrist and finger extensors, resulting in wrist drop.

Q12. Which of the following passes through the optic canal?

- A. CN II and ophthalmic artery
- B. CN II and ophthalmic vein
- C. CN III and internal carotid artery
- D. CN III and ophthalmic artery

Answer: A

Explanation: Optic canal transmits the **optic nerve (CN II)** and the **ophthalmic artery**.

Q13. Which of the following is a derivative of the **2nd pharyngeal arch**?

- A. Stapes
- B. Malleus

- C. Incus
- D. Mandible

Answer: A

Explanation: The stapes, lesser horn of hyoid, and styloid process arise from the **second arch (Reichert's cartilage)**.

Q14. The internal capsule lies between:

- A. Caudate and thalamus
- B. Thalamus and lentiform nucleus
- C. Putamen and globus pallidus
- D. Caudate and globus pallidus

Answer: B

Explanation: Internal capsule is bounded medially by thalamus and laterally by the lentiform nucleus.

Q15. The thumb is abducted by:

- A. Abductor pollicis brevis
- B. Adductor pollicis
- C. Flexor pollicis brevis
- D. Extensor pollicis longus

Answer: A

Explanation: Abductor pollicis brevis abducts the thumb at the carpometacarpal joint.

Q16. The hamate bone articulates with which metacarpals?

- A. 1st and 2nd
- B. 2nd and 3rd
- C. 4th and 5th
- D. 3rd and 4th

Answer: C

Explanation: Hamate articulates with the 4th and 5th metacarpals.

Q17. Which nerve supplies sensation to the dorsum of the foot?

- A. Saphenous nerve
- B. Deep peroneal nerve
- C. Superficial peroneal nerve
- D. Tibial nerve

Answer: C

Explanation: The superficial peroneal nerve supplies most of the dorsum of the foot except for the first web space.

Q18. What forms the floor of the femoral triangle?

- A. Adductor longus and iliopsoas
- B. Sartorius and pectineus
- C. Pectineus and iliopsoas
- D. Vastus medialis and pectineus

Answer: C

Explanation: The floor of the femoral triangle is formed by **pectineus (medially)** and **iliopsoas (laterally)**.

Q19. The **bicipital aponeurosis** protects which of the following structures?

- A. Radial artery
- B. Brachial artery and median nerve
- C. Ulnar artery
- D. Cephalic vein

Answer: B

Explanation: The bicipital aponeurosis lies superficial to the brachial artery and median nerve in the

cubital fossa.

Q20. The **ligamentum teres** of the liver is a remnant of:

- A. Umbilical vein
- B. Umbilical artery
- C. Ductus venosus
- D. Ductus arteriosus

Answer: A

Explanation: The ligamentum teres is the remnant of the **left umbilical vein**.

Q21. The **thenar muscles** are primarily innervated by:

- A. Ulnar nerve
- B. Radial nerve
- C. Median nerve
- D. Deep radial nerve

Answer: C

Explanation: The recurrent branch of the **median nerve** supplies most of the thenar muscles.

Q22. The **obturator nerve** arises from which spinal segments?

- A. L1–L2
- B. L2–L3
- C. L2–L4
- D. L3–L5

Answer: C

Explanation: The obturator nerve is derived from **L2–L4** and supplies adductor muscles.

Q23. The cerebellum controls:

- A. Conscious thought
- B. Vision
- C. Coordination and balance
- D. Emotion

Answer: C

Explanation: The cerebellum is responsible for **coordination, balance, and fine-tuning movement**.

Q24. Structure passing through **inguinal canal** in males:

- A. Femoral artery
- B. Testicular artery
- C. Vas deferens
- D. Pudendal nerve

Answer: C

Explanation: The **vas deferens**, along with testicular vessels and nerves, passes through the inguinal canal.

Q25. The saphenous opening is found in:

- A. Sartorius
- B. Fascia lata
- C. Adductor longus
- D. Tensor fascia lata

Answer: B

Explanation: The **saphenous opening** is a gap in the fascia lata, through which the great saphenous vein joins the femoral vein.

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Q26. Which muscle initiates shoulder abduction?

- A. Deltoid

- B. Supraspinatus
- C. Infraspinatus
- D. Subscapularis

Answer: B

Explanation: Supraspinatus initiates the first 15° of abduction, after which deltoid takes over.

Q27. Which nerve supplies the serratus anterior muscle?

- A. Axillary nerve
- B. Long thoracic nerve
- C. Thoracodorsal nerve
- D. Dorsal scapular nerve

Answer: B

Explanation: The long thoracic nerve (C5–C7) supplies serratus anterior; injury causes "winged scapula".

Q28. The anterior cruciate ligament (ACL) prevents:

- A. Posterior displacement of tibia
- B. Anterior displacement of tibia
- C. Medial rotation of femur
- D. Valgus stress

Answer: B

Explanation: ACL prevents anterior displacement of the tibia relative to the femur.

Q29. All of the following are branches of external carotid artery except:

- A. Superior thyroid
- B. Facial
- C. Posterior auricular
- D. Ophthalmic

Answer: D

Explanation: The ophthalmic artery is a branch of the internal carotid artery.

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Q30. The most commonly fractured carpal bone is:

- A. Scaphoid
- B. Lunate
- C. Trapezium
- D. Pisiform

Answer: A

Explanation: Scaphoid fractures are common and risk avascular necrosis due to retrograde blood supply.

Q31. Which is NOT a content of the carpal tunnel?

- A. Flexor pollicis longus
- B. Flexor digitorum profundus
- C. Flexor carpi ulnaris
- D. Median nerve

Answer: C

Explanation: Flexor carpi ulnaris lies outside the carpal tunnel and is not a content.

Q32. The nerve commonly injured during mastectomy is:

- A. Long thoracic
- B. Median
- C. Radial
- D. Axillary

Answer: A

Explanation: Long thoracic nerve is vulnerable during axillary dissection; injury causes winging of scapula.

Q33. The **common peroneal nerve** winds around which structure?

- A. Lateral condyle of femur
- B. Head of fibula
- C. Medial condyle of tibia
- D. Lateral malleolus

Answer: B

Explanation: The common peroneal nerve winds around the neck of the fibula — a common site of injury.

Q34. Which muscle forms the **medial wall** of the axilla?

- A. Pectoralis major
- B. Subscapularis
- C. Serratus anterior
- D. Latissimus dorsi

Answer: C

Explanation: Serratus anterior forms the medial wall of the axilla.

Q35. The **pterion** is the junction of all the following bones except:

- A. Frontal
- B. Temporal
- C. Parietal
- D. Occipital

Answer: D

Explanation: The pterion includes frontal, parietal, sphenoid, and temporal bones — not occipital.

Q36. The **structure at risk** in posterior knee dislocation is:

- A. Femoral artery
- B. Popliteal artery
- C. Tibial nerve
- D. Saphenous vein

Answer: B

Explanation: The popliteal artery is tethered and at high risk in posterior dislocation of the knee.

Q37. The **danger area of the face** drains into:

- A. Internal jugular vein
- B. External jugular vein
- C. Cavernous sinus
- D. Subclavian vein

Answer: C

Explanation: The facial vein communicates with the cavernous sinus via angular and ophthalmic veins — infection risk.

Q38. The **most superficial muscle in perineum** is:

- A. Deep transverse perineal
- B. External anal sphincter
- C. Superficial transverse perineal
- D. Bulbospongiosus

Answer: C

Explanation: The superficial transverse perineal muscle lies in the superficial perineal pouch.

Q39. The **pituitary gland** lies in:

- A. Ethmoid sinus
- B. Foramen magnum
- C. Sella turcica

D. Cribriform plate

Answer: C

Explanation: The pituitary gland sits within the sella turcica of the sphenoid bone.

Q40. The deep peroneal nerve supplies:

- A. Peroneus longus
- B. Tibialis posterior
- C. Extensor digitorum longus
- D. Gastrocnemius

Answer: C

Explanation: Deep peroneal nerve supplies anterior compartment muscles including EDL.

Q41. Claw hand results from injury to:

- A. Radial nerve
- B. Median nerve
- C. Ulnar nerve
- D. Axillary nerve

Answer: C

Explanation: Ulnar nerve injury causes hyperextension at MCP and flexion at IP joints — claw hand.

Q42. Trendelenburg gait is caused by weakness of:

- A. Gluteus maximus
- B. Gluteus medius
- C. Psoas major
- D. Adductor magnus

Answer: B

Explanation: Weak gluteus medius/minimus causes dropping of pelvis on the opposite side when walking.

Q43. Lymph from the testes drains into:

- A. Inguinal lymph nodes
- B. Pelvic nodes
- C. Para-aortic nodes
- D. External iliac nodes

Answer: C

Explanation: Testicular lymphatics follow the testicular vessels to **para-aortic (lumbar) lymph nodes**.

Q44. The middle meningeal artery is a branch of:

- A. Internal carotid
- B. Maxillary artery
- C. Superficial temporal
- D. Occipital artery

Answer: B

Explanation: It is a branch of the **maxillary artery**, which is a terminal branch of external carotid.

Q45. The gastrocnemius muscle is innervated by:

- A. Common peroneal
- B. Deep peroneal
- C. Tibial nerve
- D. Femoral nerve

Answer: C

Explanation: Gastrocnemius, a posterior leg muscle, is supplied by the **tibial nerve**.

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Q46. Which of the following passes through the esophageal hiatus?

- A. Thoracic duct
- B. Aorta
- C. Inferior vena cava
- D. Vagus nerve

Answer: D

Explanation: The **vagus nerve** (esophageal plexus) passes with the esophagus through the diaphragm at T10.

Q47. The **linea alba** is formed by aponeuroses of:

- A. External oblique only
- B. Internal oblique only
- C. Transversus abdominis only
- D. All three flat abdominal muscles

Answer: D

Explanation: Linea alba is a midline fibrous raphe formed by the aponeuroses of external, internal oblique and transversus abdominis.

Q48. Which of the following supplies **sensation to the lateral forearm**?

- A. Median nerve
- B. Lateral cutaneous nerve of forearm
- C. Musculocutaneous nerve
- D. Radial nerve

Answer: B

Explanation: It's the terminal sensory branch of the musculocutaneous nerve.

Q49. The **laryngeal inlet** is guarded by:

- A. Vocal cords
- B. Epiglottis
- C. Arytenoid cartilage
- D. Cricoid cartilage

Answer: B

Explanation: The **epiglottis** folds backward during swallowing to cover the laryngeal inlet.

Q50. The **subarachnoid space** ends at which vertebral level?

- A. L1
- B. L2
- C. S2
- D. S4

Answer: C

Explanation: The subarachnoid space extends down to **S2**, where the dural sac terminates.

Q51. Which muscle is pierced by the **musculocutaneous nerve**?

- A. Biceps brachii
- B. Coracobrachialis
- C. Triceps brachii
- D. Brachialis

Answer: B

Explanation: Musculocutaneous nerve pierces **coracobrachialis** then travels between biceps and brachialis.

Q52. The **sphenoidal sinus** drains into:

- A. Middle meatus
- B. Superior meatus
- C. Sphenoethmoidal recess

D. Inferior meatus

Answer: C

Explanation: The sphenoidal sinus opens into the **sphenoethmoidal recess**, located above the superior concha.

Q53. The **thoracic duct** drains into:

- A. Right subclavian vein
- B. Left subclavian vein
- C. Left brachiocephalic vein
- D. Superior vena cava

Answer: B

Explanation: The thoracic duct ends at the junction of the **left internal jugular** and **left subclavian** veins.

Q54. The **sensory innervation of the angle of mandible** is by:

- A. Auriculotemporal nerve
- B. Greater auricular nerve
- C. Mental nerve
- D. Buccal nerve

Answer: B

Explanation: The **angle of the mandible** is supplied by the **greater auricular nerve** (C2–C3), not the trigeminal nerve.

Q55. Which of the following opens into the **middle meatus**?

- A. Sphenoidal sinus
- B. Maxillary sinus
- C. Posterior ethmoid sinus
- D. Nasolacrimal duct

Answer: B

Explanation: The **maxillary, frontal, and anterior ethmoidal sinuses** open into the **middle meatus**.

Q56. The **pons** is supplied by branches of which artery?

- A. Vertebral artery
- B. Basilar artery
- C. Middle cerebral artery
- D. Posterior cerebral artery

Answer: B

Explanation: The **basilar artery**, formed by vertebral arteries, supplies most of the pons.

Q57. The **middle cerebral artery** supplies all EXCEPT:

- A. Broca's area
- B. Wernicke's area
- C. Primary motor cortex (face/arm)
- D. Occipital cortex

Answer: D

Explanation: The **occipital cortex** is supplied by the **posterior cerebral artery**, not MCA.

Q58. The **optic chiasm** lies just above the:

- A. Pituitary gland
- B. Mamillary body
- C. Tectum
- D. Pons

Answer: A

Explanation: The optic chiasm is located superior to the **pituitary gland** in the suprasellar cistern.

Q59. The **recurrent laryngeal nerve** is a branch of:

- A. Glossopharyngeal
- B. Hypoglossal
- C. Vagus
- D. Accessory

Answer: C

Explanation: The **vagus nerve** gives off recurrent laryngeal nerves that supply all intrinsic laryngeal muscles (except cricothyroid).

Q60. The **nasolacrimal duct** drains into:

- A. Superior meatus
- B. Inferior meatus
- C. Middle meatus
- D. Nasopharynx

Answer: B

Explanation: The nasolacrimal duct opens into the **inferior meatus** beneath the inferior turbinate.

Q61. The **phrenic nerve** arises from which cervical roots?

- A. C1–C2
- B. C2–C3
- C. C3–C5
- D. C5–C7

Answer: C

Explanation: The **phrenic nerve** originates from **C3–C5**, “C3, 4, 5 keeps the diaphragm alive.”

Q62. The **cribriform plate** transmits which cranial nerve?

- A. CN I
- B. CN II
- C. CN III
- D. CN V

Answer: A

Explanation: The **cribriform plate** of ethmoid bone transmits **olfactory nerve (CN I)** fibers.

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Q63. The **jugular foramen** transmits all EXCEPT:

- A. CN IX
- B. CN X
- C. CN XI
- D. CN XII

Answer: D

Explanation: CN IX, X, and XI pass through the **jugular foramen**; CN XII exits via **hypoglossal canal**.

Q64. The **nerve passing through the parotid gland** is:

- A. Facial nerve
- B. Glossopharyngeal nerve
- C. Trigeminal nerve
- D. Auriculotemporal nerve

Answer: A

Explanation: The **facial nerve (CN VII)** passes through the parotid gland and divides into its terminal branches.

Q65. The **cerebrospinal fluid (CSF)** is primarily formed by:

- A. Arachnoid granulations
- B. Ependymal cells
- C. Choroid plexus

D. Pia mater

Answer: C

Explanation: CSF is formed by the **choroid plexus** in the lateral, third, and fourth ventricles.

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Q66. The **middle ear cavity** communicates with:

- A. External auditory canal
- B. Nasopharynx
- C. Internal auditory canal
- D. Frontal sinus

Answer: B

Explanation: The **Eustachian (auditory) tube** connects the **middle ear** to the **nasopharynx**.

Q67. The **nerve supplying cricothyroid muscle** is:

- A. External branch of superior laryngeal
- B. Internal branch of superior laryngeal
- C. Recurrent laryngeal
- D. Glossopharyngeal

Answer: A

Explanation: **Cricothyroid** is the only laryngeal muscle supplied by the **external branch of the superior laryngeal nerve**.

Q68. The **tentorium cerebelli** separates:

- A. Cerebrum and cerebellum
- B. Right and left hemispheres
- C. Frontal and parietal lobes
- D. Cerebellar hemispheres

Answer: A

Explanation: The **tentorium cerebelli** is a dural fold that separates the **cerebrum (occipital lobe)** from the **cerebellum**.

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Q69. Which of the following cranial nerves is **purely motor**?

- A. CN V
- B. CN VII
- C. CN XI
- D. CN IX

Answer: C

Explanation: **Spinal accessory nerve (CN XI)** is purely motor, supplying sternocleidomastoid and trapezius.

Q70. The **internal jugular vein** is a continuation of:

- A. Facial vein
- B. Transverse sinus
- C. Sigmoid sinus
- D. Subclavian vein

Answer: C

Explanation: The **sigmoid sinus** continues as the **internal jugular vein** after exiting the jugular foramen.

Q71. The **falx cerebri** is attached to which bony landmark?

- A. Crista galli
- B. Sella turcica
- C. Clivus
- D. External occipital protuberance

Answer: A

Explanation: The **falx cerebri** attaches anteriorly to the **crista galli** of the ethmoid bone.

Q72. Which cranial nerve emerges from the **dorsal aspect** of the brainstem?

- A. CN IV
- B. CN III
- C. CN VI
- D. CN V

Answer: A

Explanation: The **trochlear nerve (CN IV)** is the only cranial nerve that emerges from the **dorsal aspect** of the midbrain.

Q73. The **facial artery** is a branch of:

- A. Internal carotid
- B. Maxillary artery
- C. External carotid artery
- D. Vertebral artery

Answer: C

Explanation: Facial artery is one of the **anterior branches of the external carotid artery**.

Q74. The **stylomastoid foramen** transmits which nerve?

- A. Glossopharyngeal
- B. Facial nerve
- C. Vagus nerve
- D. Hypoglossal nerve

Answer: B

Explanation: The **facial nerve** exits the skull via the **stylomastoid foramen**.

Q75. The **main blood supply to the brain** is via:

- A. Internal jugular vein
- B. External carotid arteries
- C. Vertebral and internal carotid arteries
- D. Maxillary arteries

Answer: C

Explanation: The brain receives arterial blood from **internal carotid and vertebral arteries**, forming the **circle of Willis**.

Q76. Which part of the brain is responsible for **speech production** (motor)?

- A. Wernicke's area
- B. Angular gyrus
- C. Broca's area
- D. Prefrontal cortex

Answer: C

Explanation: Broca's area (in the inferior frontal gyrus of dominant hemisphere) controls speech articulation.

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Q77. The **spinal cord** ends at what vertebral level in adults?

- A. L1–L2
- B. L3–L4
- C. L2–L3
- D. T12–L1

Answer: A

Explanation: The adult spinal cord terminates at the lower border of **L1 or upper L2** vertebral level.

Q78. The **common carotid artery** bifurcates at:

- A. C2

- B. C3
- C. C4
- D. C5

Answer: C

Explanation: Common carotid artery divides into internal and external branches at the level of **C4**, near the upper border of thyroid cartilage.

Q79. The largest branch of the brachial artery is:

- A. Profunda brachii
- B. Radial artery
- C. Ulnar artery
- D. Nutrient artery

Answer: A

Explanation: The **profunda brachii artery** is the largest branch, running in the radial groove with the radial nerve.

Q80. Cerebellar tonsils herniating through the foramen magnum results in:

- A. Tentorial herniation
- B. Chiari malformation
- C. Hydrocephalus
- D. Subfalcine herniation

Answer: B

Explanation: Inferior descent of cerebellar tonsils through foramen magnum = **Chiari Type I malformation**.

Q81. The sensory innervation of the anterior 2/3 of tongue is by:

- A. Glossopharyngeal nerve
- B. Lingual nerve
- C. Facial nerve
- D. Hypoglossal nerve

Answer: B

Explanation: General sensation is from **lingual nerve** (branch of mandibular nerve, V3). Taste via **chorda tympani**.

Q82. The dura mater receives blood supply primarily from:

- A. Vertebral artery
- B. Basilar artery
- C. Middle meningeal artery
- D. Internal carotid artery

Answer: C

Explanation: The **middle meningeal artery**, a branch of maxillary artery, supplies the dura mater.

Q83. The muscle that opens the Eustachian tube during swallowing is:

- A. Tensor tympani
- B. Levator veli palatini
- C. Tensor veli palatini
- D. Stylopharyngeus

Answer: C

Explanation: **Tensor veli palatini** opens the Eustachian tube to equalize pressure.

Q84. The right recurrent laryngeal nerve loops around:

- A. Aortic arch
- B. Right subclavian artery
- C. Brachiocephalic trunk

D. Trachea

Answer: B

Explanation: On the **right**, the recurrent laryngeal nerve loops around the **right subclavian artery**.

Q85. The **trapezius muscle** is innervated by:

- A. Accessory nerve
- B. Long thoracic nerve
- C. Dorsal scapular nerve
- D. Axillary nerve

Answer: A

Explanation: The spinal part of the **accessory nerve (CN XI)** supplies the trapezius.

Q86. The **left testicular vein** drains into the:

- A. Left renal vein
- B. Inferior vena cava
- C. External iliac vein
- D. Azygos vein

Answer: A

Explanation: The **left testicular vein** drains into the **left renal vein**, while the right drains directly into the IVC.

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Q87. The **foramen rotundum** transmits:

- A. Mandibular nerve
- B. Maxillary nerve
- C. Oculomotor nerve
- D. Facial nerve

Answer: B

Explanation: The **maxillary nerve (V2)** exits the middle cranial fossa via the foramen rotundum.

Q88. The **stylopharyngeus muscle** is supplied by:

- A. Glossopharyngeal nerve
- B. Vagus nerve
- C. Accessory nerve
- D. Facial nerve

Answer: A

Explanation: Stylopharyngeus is the only muscle innervated by the **glossopharyngeal nerve (CN IX)**.

Q89. The **first branch of the external carotid artery** is:

- A. Facial artery
- B. Ascending pharyngeal artery
- C. Superior thyroid artery
- D. Occipital artery

Answer: C

Explanation: The **superior thyroid artery** is the first anterior branch.

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Q90. The **carotid sinus** is a baroreceptor supplied by:

- A. Vagus nerve
- B. Hypoglossal nerve
- C. Glossopharyngeal nerve
- D. Sympathetic chain

Answer: C

Explanation: The **carotid sinus** is innervated by the **glossopharyngeal nerve (CN IX)** via Hering's nerve.

Q91. The **saphenous nerve** is a branch of:

- A. Tibial nerve
- B. Femoral nerve
- C. Obturator nerve
- D. Sciatic nerve

Answer: B

Explanation: The **saphenous nerve** is the longest cutaneous branch of the **femoral nerve**, supplying medial leg and foot.

Q92. The **median nerve** in the arm lies:

- A. Lateral to brachial artery
- B. Medial to brachial artery
- C. Anterior to brachial artery
- D. Posterior to brachial artery

Answer: B

Explanation: In the mid-arm, the **median nerve** lies **medial to the brachial artery**.

Q93. The **aortic hiatus** transmits all EXCEPT:

- A. Aorta
- B. Thoracic duct
- C. Azygos vein
- D. Esophagus

Answer: D

Explanation: The **esophagus** passes through its own opening at **T10**. Aortic hiatus (T12) transmits aorta, thoracic duct, azygos.

Q94. The **inguinal ligament** is a thickening of:

- A. Fascia lata
- B. Transversalis fascia
- C. External oblique aponeurosis
- D. Scarpa's fascia

Answer: C

Explanation: The **inguinal ligament** is formed by the **lower border of the external oblique aponeurosis**.

Q95. The **most common site for lumbar puncture** is:

- A. L1–L2
- B. L2–L3
- C. L3–L4
- D. L5–S1

Answer: C

Explanation: Lumbar puncture is safely performed at **L3–L4** or **L4–L5**, below spinal cord termination.

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Q96. The **transpyloric plane** corresponds to which vertebral level?

- A. L2
- B. L1
- C. T12
- D. L3

Answer: B

Explanation: The **transpyloric plane** passes through **L1**, midway between the jugular notch and pubic symphysis.

Q97. The **posterior cricoarytenoid** muscle action is:

- A. Close vocal cords
- B. Open vocal cords
- C. Lengthen vocal cords

D. Relax vocal cords

Answer: B

Explanation: Posterior cricoarytenoid is the **only abductor** of vocal cords (opens rima glottidis).

Q98. The **sensory supply of the cornea** is from:

- A. Facial nerve
- B. Optic nerve
- C. Trigeminal nerve
- D. Oculomotor nerve

Answer: C

Explanation: The **nasociliary branch** of the ophthalmic division (V1) of **trigeminal nerve** supplies the cornea.

Q99. The **sinoatrial (SA) node** is most commonly supplied by:

- A. Right coronary artery
- B. Left coronary artery
- C. Anterior interventricular artery
- D. Circumflex artery

Answer: A

Explanation: The SA node is supplied by a branch of the **right coronary artery** in 60–70% of people.

Q100. The **central tendon of the diaphragm** is derived from:

- A. Septum transversum
- B. Pleuroperitoneal membrane
- C. Mesentery of esophagus
- D. Body wall

Answer: A

Explanation: The **central tendon** originates from the **septum transversum**, one of the embryologic components of diaphragm.

Q101. The **inguinal canal** in males contains:

- A. Inferior epigastric artery
- B. Vas deferens
- C. Femoral nerve
- D. Round ligament

Answer: B

Explanation: In males, the inguinal canal contains the **spermatic cord**, which includes the vas deferens.

Q102. The **nerve passing through the foramen ovale** is:

- A. Maxillary nerve
- B. Mandibular nerve
- C. Facial nerve
- D. Oculomotor nerve

Answer: B

Explanation: The **mandibular nerve (V3)** passes through the foramen ovale.

Q103. The **nerve responsible for the cremasteric reflex** is:

- A. Genitofemoral nerve
- B. Ilioinguinal nerve
- C. Pudendal nerve
- D. Femoral nerve

Answer: A

Explanation: The **genital branch of the genitofemoral nerve** is the efferent limb of the cremasteric reflex.

Q104. The **transversalis fascia** gives rise to which layer in the spermatic cord?

- A. Internal spermatic fascia
- B. Cremasteric fascia
- C. External spermatic fascia
- D. Dartos fascia

Answer: A

Explanation: The **internal spermatic fascia** is derived from the **transversalis fascia**.

Q105. The **pudendal nerve** exits the pelvis through the:

- A. Greater sciatic foramen
- B. Lesser sciatic foramen
- C. Obturator foramen
- D. Inguinal canal

Answer: A

Explanation: The pudendal nerve exits the pelvis via the **greater sciatic foramen**, then re-enters via the lesser sciatic.

Q106. The **appendix** is most commonly located in which position?

- A. Pelvic
- B. Retrocecal
- C. Subcecal
- D. Pre-ileal

Answer: B

Explanation: The **retrocecal** position is the most common anatomical location of the appendix.

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Q107. The **ligamentum venosum** is a remnant of:

- A. Umbilical vein
- B. Umbilical artery
- C. Ductus venosus
- D. Ductus arteriosus

Answer: C

Explanation: The **ductus venosus** becomes the **ligamentum venosum** after birth.

Q108. The **ampulla of Vater** is located in:

- A. 1st part of duodenum
- B. 2nd part of duodenum
- C. 3rd part of duodenum
- D. Jejunum

Answer: B

Explanation: The **ampulla of Vater** is in the **posteromedial wall of the 2nd part of the duodenum**, where bile and pancreatic ducts open.

Q109. The **white rami communicantes** carry:

- A. Postganglionic sympathetic fibers
- B. Preganglionic sympathetic fibers
- C. Sensory fibers only
- D. Parasympathetic fibers

Answer: B

Explanation: White rami communicantes carry **preganglionic sympathetic fibers** from spinal nerves to the sympathetic chain.

Q110. The **McBurney's point** is located at:

- A. 1/2 from ASIS to umbilicus
- B. 1/3 from ASIS to umbilicus

C. 2/3 from ASIS to umbilicus

D. At the umbilicus

Answer: C

Explanation: McBurney's point lies at the **junction of lateral 1/3 and medial 2/3** of the line from ASIS to umbilicus.

Q111. The sensory innervation to the perineum is via:

A. Ilioinguinal nerve

B. Femoral nerve

C. Pudendal nerve

D. Genitofemoral nerve

Answer: C

Explanation: The **pudendal nerve (S2–S4)** supplies motor and sensory innervation to the perineum.

Q112. The levator ani muscle includes all EXCEPT:

A. Puborectalis

B. Pubococcygeus

C. Iliococcygeus

D. Coccygeus

Answer: D

Explanation: **Coccygeus** is not part of levator ani; it is a separate muscle of pelvic floor.

Q113. The coronary sinus drains into:

A. Right atrium

B. Left atrium

C. Superior vena cava

D. Inferior vena cava

Answer: A

Explanation: The **coronary sinus** drains the myocardium and opens into the **right atrium**.

Q114. The blood supply to the SA node is most commonly from:

A. Right coronary artery

B. Left coronary artery

C. Circumflex artery

D. Anterior interventricular artery

Answer: A

Explanation: The **right coronary artery** supplies the SA node in most individuals (60–70%).

Q115. The pain from diaphragmatic irritation is referred to:

A. Epigastrium

B. Right hypochondrium

C. Tip of shoulder

D. Lower chest

Answer: C

Explanation: Referred pain from diaphragm (via phrenic nerve C3–C5) goes to **shoulder region (C5 dermatome)**.

Q116. Esophageal constrictions occur at all EXCEPT:

A. Cricoid cartilage

B. Aortic arch

C. Left main bronchus

D. T12 vertebra

Answer: D

Explanation: The three constrictions are at **C6 (cricoid)**, **T4 (aortic arch)**, and **T5–T6 (bronchus)**. T12 is

the hiatus, not a constriction point.

Q117. The most posterior structure at the hilum of the lung is:

- A. Pulmonary artery
- B. Bronchus
- C. Pulmonary vein
- D. Lymph node

Answer: B

Explanation: At the lung hilum, the **bronchus** is usually the most posterior structure.

Q118. The aortic arch gives rise to how many branches?

- A. 2
- B. 3
- C. 4
- D. 5

Answer: B

Explanation: The **brachiocephalic trunk, left common carotid, and left subclavian** arteries arise from the aortic arch.

Q119. The nerve supply of the diaphragm is from:

- A. Intercostal nerves
- B. Phrenic nerve
- C. Vagus nerve
- D. Lumbar plexus

Answer: B

Explanation: The **phrenic nerve (C3–C5)** provides **motor and sensory** innervation to the diaphragm.

Q120. The epiploic (omental) foramen connects:

- A. Greater and lesser sac
- B. Peritoneal cavity and pelvic cavity
- C. Right and left pleural cavities
- D. Right and left kidneys

Answer: A

Explanation: The **epiploic foramen (of Winslow)** connects the **greater and lesser sacs** of the peritoneum.

Q121. The kidney is located opposite which vertebral levels?

- A. T12–L3
- B. T10–L1
- C. L1–L4
- D. T11–L2

Answer: A

Explanation: The right kidney lies slightly lower than the left, but both span **T12–L3** levels.

Q122. Which of the following is intraperitoneal?

- A. Kidney
- B. Pancreas
- C. Duodenum (2nd part)
- D. Jejunum

Answer: D

Explanation: **Jejunum** is **intraperitoneal**; others are retroperitoneal.

Q123. The liver develops from:

- A. Foregut endoderm
- B. Midgut mesoderm

C. Hindgut ectoderm

D. Yolk sac

Answer: A

Explanation: The **hepatic diverticulum** (liver bud) arises from **foregut endoderm**.

Q124. The **obturator internus** exits the pelvis via:

A. Greater sciatic foramen

B. Lesser sciatic foramen

C. Obturator foramen

D. Inguinal canal

Answer: B

Explanation: **Obturator internus** leaves the pelvis via the **lesser sciatic foramen**.

Q125. The **deep inguinal ring** is an opening in the:

A. External oblique aponeurosis

B. Transversalis fascia

C. Internal oblique

D. Inguinal ligament

Answer: B

Explanation: The **deep inguinal ring** is an opening in the **transversalis fascia**, just above the midpoint of the inguinal ligament.

Q126. The **tail of the pancreas** lies in contact with which organ?

A. Liver

B. Duodenum

C. Spleen

D. Left kidney

Answer: C

Explanation: The **tail of the pancreas** lies in the **splenorenal ligament**, contacting the **hilum of the spleen**.

Q127. The **cervix** is supplied by branches of:

A. Internal iliac artery

B. External iliac artery

C. Uterine artery

D. A and C

Answer: D

Explanation: The cervix receives blood from the **uterine artery** (a branch of internal iliac).

Q128. The **urachus** becomes which structure in adults?

A. Median umbilical ligament

B. Medial umbilical ligament

C. Round ligament

D. Ligamentum teres

Answer: A

Explanation: The **urachus** forms the **median umbilical ligament**.

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Q129. The **broad ligament** contains all EXCEPT:

A. Fallopian tube

B. Round ligament

C. Ovarian ligament

D. Ovary

Answer: D

Explanation: The **ovary** is attached to the posterior layer of the broad ligament via the **mesovarium**, but not enclosed within it.

Q130. The isthmus of the uterus is located:

- A. Between body and fundus
- B. Between cervix and body
- C. At external os
- D. Within endometrium

Answer: B

Explanation: The **isthmus** is the narrow region between the **body and cervix** of the uterus.

Q131. The muscle responsible for closing the eyelids:

- A. Orbicularis oculi
- B. Levator palpebrae superioris
- C. Superior tarsal muscle
- D. Frontalis

Correct Answer: A. Orbicularis oculi

Explanation: It is a facial muscle innervated by the facial nerve and functions to close the eyelids.

Q132. The parasympathetic fibers to the parotid gland are carried by:

- A. Facial nerve
- B. Glossopharyngeal nerve
- C. Vagus nerve
- D. Trigeminal nerve

Correct Answer: B. Glossopharyngeal nerve

Explanation: Parasympathetic supply reaches parotid via CN IX → lesser petrosal nerve → otic ganglion → auriculotemporal nerve.

Q133. The ligamentum arteriosum connects:

- A. Right and left atria
- B. Aorta and pulmonary trunk
- C. Superior and inferior vena cava
- D. Left atrium and pulmonary vein

Correct Answer: B. Aorta and pulmonary trunk

Explanation: It is a remnant of the ductus arteriosus.

Q134. The innervation of the cricothyroid muscle is by:

- A. Recurrent laryngeal nerve
- B. External branch of superior laryngeal nerve
- C. Glossopharyngeal nerve
- D. Internal laryngeal nerve

Correct Answer: B. External branch of superior laryngeal nerve

Explanation: It is the only intrinsic laryngeal muscle not supplied by recurrent laryngeal nerve.

Q135. The artery that supplies the SA node most commonly arises from:

- A. Left coronary artery
- B. Right coronary artery
- C. Circumflex branch
- D. Left anterior descending

Correct Answer: B. Right coronary artery

Explanation: In most individuals, the SA nodal branch originates from the RCA.

Q136. The bony part forming the nasal septum includes:

- A. Vomer
- B. Perpendicular plate of ethmoid
- C. Nasal bone

D. A and B

Correct Answer: D. A and B

Explanation: The bony nasal septum is made by the vomer and perpendicular plate of ethmoid.

Q137. Which sinus opens into the superior meatus?

- A. Maxillary sinus
- B. Ethmoidal posterior sinus
- C. Frontal sinus
- D. Sphenoidal sinus

Correct Answer: B. Ethmoidal posterior sinus

Explanation: Posterior ethmoidal air cells drain into the superior meatus.

Q138. The primary site of CSF absorption is:

- A. Arachnoid villi
- B. Choroid plexus
- C. Cerebral aqueduct
- D. Lateral ventricles

Correct Answer: A. Arachnoid villi

Explanation: They protrude into dural venous sinuses and absorb CSF into the bloodstream.

Q139. The femoral sheath contains all EXCEPT:

- A. Femoral artery
- B. Femoral vein
- C. Femoral nerve
- D. Deep inguinal lymph nodes

Correct Answer: C. Femoral nerve

Explanation: The femoral nerve lies lateral to the femoral sheath.

Q140. The rotator cuff includes all EXCEPT:

- A. Supraspinatus
- B. Infraspinatus
- C. Teres major
- D. Subscapularis

Correct Answer: C. Teres major

Explanation: Rotator cuff = SITS muscles: Supraspinatus, Infraspinatus, Teres minor, Subscapularis.

Q141. The sensory supply of the skin over the angle of the mandible is from:

- A. Mandibular nerve
- B. Facial nerve
- C. Greater auricular nerve
- D. Auriculotemporal nerve

Correct Answer: C. Greater auricular nerve

Explanation: A branch of cervical plexus (C2, C3), not a cranial nerve.

Q142. The thoracic duct drains into:

- A. Right subclavian vein
- B. Right internal jugular vein
- C. Left subclavian vein
- D. Superior vena cava

Correct Answer: C. Left subclavian vein

Explanation: It drains at the junction of the left subclavian and internal jugular veins.

Q143. The nerve passing between the lateral and medial heads of the triceps:

- A. Radial nerve

- B. Ulnar nerve
- C. Median nerve
- D. Axillary nerve

Correct Answer: A. Radial nerve

Explanation: It travels in the radial groove of the humerus.

Q144. The muscle pierced by the parotid duct is:

- A. Buccinator
- B. Masseter
- C. Risorius
- D. Orbicularis oris

Correct Answer: A. Buccinator

Explanation: The duct pierces buccinator to open into the oral cavity.

Q145. The most medial structure at the hilum of the kidney is:

- A. Renal vein
- B. Renal artery
- C. Renal pelvis
- D. Ureter

Correct Answer: C. Renal pelvis

Explanation: From anterior to posterior: vein → artery → pelvis.

Q146. The pituitary gland sits in:

- A. Foramen ovale
- B. Sella turcica
- C. Cribriform plate
- D. Internal acoustic meatus

Correct Answer: B. Sella turcica

Explanation: It is a depression in the sphenoid bone.

Q147. The nerve affected in wrist drop is:

- A. Median nerve
- B. Ulnar nerve
- C. Radial nerve
- D. Axillary nerve

Correct Answer: C. Radial nerve

Explanation: Radial nerve injury results in inability to extend the wrist.

Q148. The ligament that prevents hyperextension of the hip:

- A. Ischiofemoral
- B. Pubofemoral
- C. Iliofemoral
- D. Round ligament

Correct Answer: C. Iliofemoral

Explanation: Known as the strongest ligament of the body.

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Q149. The artery supplying the visual cortex is:

- A. Anterior cerebral artery
- B. Posterior cerebral artery
- C. Middle cerebral artery
- D. Basilar artery

Correct Answer: B. Posterior cerebral artery

Explanation: Supplies the occipital lobe including primary visual cortex.

Q150. The nerve most commonly injured in anterior shoulder dislocation:

- A. Musculocutaneous nerve
- B. Axillary nerve
- C. Suprascapular nerve
- D. Radial nerve

Correct Answer: B. Axillary nerve

Explanation: It wraps around the surgical neck of the humerus and supplies the deltoid.

Q151. The pelvic inlet is widest in which direction?

- A. Anteroposterior
- B. Transverse
- C. Oblique
- D. Vertical

Answer: B

Explanation: The **transverse diameter** is the widest at the **pelvic inlet**.

Q152. The ischial spine serves as a landmark for which structure?

- A. Pudendal nerve
- B. Ureter
- C. Uterine artery
- D. Ovary

Answer: A

Explanation: The **pudendal nerve** crosses near the **ischial spine** and is used in pudendal nerve blocks.

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Q153. The sacrospinous ligament extends between:

- A. Sacrum and ischial tuberosity
- B. Sacrum and ischial spine
- C. Coccyx and ischial spine
- D. Ilium and pubis

Answer: B

Explanation: The **sacrospinous ligament** runs from **sacrum to ischial spine**, forming the greater sciatic foramen.

Q154. The perineal body provides attachment to all except:

- A. Bulbospongiosus
- B. Ischiocavernosus
- C. External anal sphincter
- D. Superficial transverse perineal

Answer: B

Explanation: **Ischiocavernosus** does not attach to the perineal body.

Q155. The uterine artery crosses which structure superiorly?

- A. Ovary
- B. Broad ligament
- C. Ureter
- D. Round ligament

Answer: C

Explanation: "Water under the bridge" – the **ureter** passes **under the uterine artery**.

Q156. The pubic symphysis is what type of joint?

- A. Synovial
- B. Synchondrosis
- C. Secondary cartilaginous
- D. Syndesmosis

Answer: C

Explanation: The **pubic symphysis** is a **secondary cartilaginous joint** (fibrocartilage between bones).

Q157. The **blood supply to the ovary** is mainly from:

- A. Uterine artery
- B. Ovarian artery
- C. Internal pudendal artery
- D. Inferior epigastric artery

Answer: B

Explanation: The **ovarian artery**, a direct branch of the **abdominal aorta**, supplies the ovaries.

Q158. The **clitoris** is homologous to which male structure?

- A. Prostate
- B. Penis
- C. Scrotum
- D. Bulbourethral gland

Answer: B

Explanation: The **clitoris** is the female **homologue of the penis**.

Q159. The **ischiocavernosus muscle** helps in:

- A. Urine retention
- B. Ejaculation
- C. Maintaining erection
- D. Micturition

Answer: C

Explanation: It compresses the crus of penis/clitoris to maintain erection.

Q160. The **vas deferens** joins which structure to form the ejaculatory duct?

- A. Prostate
- B. Seminal vesicle
- C. Epididymis
- D. Bulbourethral gland

Answer: B

Explanation: The **vas deferens** joins the **seminal vesicle duct** to form the **ejaculatory duct**.

Q161. The **prostatic urethra** is the part where:

- A. External sphincter is located
- B. Ejaculatory ducts open
- C. Bulbourethral glands open
- D. Internal urethral sphincter is located

Answer: B

Explanation: The **ejaculatory ducts** open into the **prostatic urethra**.

Q162. The **ovarian ligament** is a remnant of:

- A. Gubernaculum
- B. Wolffian duct
- C. Mullerian duct
- D. Mesonephros

Answer: A

Explanation: The **ovarian ligament** and **round ligament** are remnants of the **gubernaculum**.

Q163. The **ischial tuberosity** is the origin for:

- A. Quadriceps
- B. Adductors

- C. Hamstrings
- D. Iliopsoas

Answer: C

Explanation: The **hamstring muscles** (biceps femoris long head, semitendinosus, semimembranosus) originate from **ischial tuberosity**.

Q164. The **sciatic nerve** exits the pelvis through the:

- A. Greater sciatic foramen
- B. Lesser sciatic foramen
- C. Inguinal canal
- D. Femoral canal

Answer: A

Explanation: The **sciatic nerve** exits via the **greater sciatic foramen**, below piriformis.

Q165. The **common iliac artery** bifurcates into:

- A. External and internal iliac arteries
- B. Renal and femoral arteries
- C. Aortic and sacral arteries
- D. Uterine and ovarian arteries

Answer: A

Explanation: At L5/S1, **common iliac arteries** bifurcate into **internal and external iliac arteries**.

Q166. The **navel (umbilicus)** lies at what vertebral level?

- A. T10
- B. T12
- C. L3
- D. L4

Answer: A

Explanation: **T10 dermatome** innervates the **umbilicus**.

Q167. The **inguinal ligament** stretches from:

- A. ASIS to pubic tubercle
- B. ASIS to pubic symphysis
- C. Iliac crest to pubic crest
- D. Pubic tubercle to ischial spine

Answer: A

Explanation: It extends from **anterior superior iliac spine (ASIS)** to **pubic tubercle**.

Q168. The **sciatic nerve** is composed of which spinal roots?

- A. L1–L3
- B. L2–L4
- C. L4–S3
- D. S2–S4

Answer: C

Explanation: The **sciatic nerve** is derived from **L4–S3**.

Q169. The **dorsalis pedis artery** is a continuation of:

- A. Posterior tibial artery
- B. Anterior tibial artery
- C. Peroneal artery
- D. Popliteal artery

Answer: B

Explanation: **Dorsalis pedis** is the **direct continuation of anterior tibial artery** over the dorsum of the foot.

Q170. Internal hemorrhoids are painless because:

- A. Rich nerve supply
- B. Supplied by somatic nerves
- C. Above pectinate line
- D. Below pectinate line

Answer: C

Explanation: Internal hemorrhoids are above the pectinate line and supplied by visceral nerves (painless).

Q171. The conus medullaris ends at what vertebral level?

- A. T12
- B. L1
- C. L3
- D. S1

Answer: B

Explanation: The conus medullaris marks the end of the spinal cord at approximately L1 in adults.

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Q172. The filum terminale is a continuation of:

- A. Conus medullaris
- B. Cauda equina
- C. Dura mater
- D. Spinal nerve

Answer: A

Explanation: The filum terminale is a fibrous extension of the pia mater from the conus medullaris.

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Q173. The cerebellum is connected to the brainstem by:

- A. One cerebellar peduncle
- B. Two cerebellar peduncles
- C. Three cerebellar peduncles
- D. Four cerebellar peduncles

Answer: C

Explanation: Superior, middle, and inferior cerebellar peduncles connect cerebellum to midbrain, pons, and medulla respectively.

Q174. The internal capsule contains fibers of:

- A. Upper motor neurons
- B. Lower motor neurons
- C. Sensory tracts only
- D. Olfactory tracts

Answer: A

Explanation: The internal capsule contains corticospinal and corticobulbar tracts, part of upper motor neuron system.

Q175. The arachnoid granulations are involved in:

- A. CSF production
- B. CSF absorption
- C. Blood-brain barrier
- D. Venous drainage

Answer: B

Explanation: Arachnoid granulations allow CSF absorption into the superior sagittal sinus.

Q176. The vertebral artery passes through the foramen transversarium of which vertebrae?

- A. C1–C7
- B. C2–C6
- C. C1–C6

D. C6–T1

Answer: C

Explanation: The **vertebral artery** enters at **C6** and ascends through **C6–C1** transverse foramina.

Q177. The **tentorial notch** allows passage of:

- A. Optic nerve
- B. Spinal cord
- C. Brainstem
- D. Pituitary stalk

Answer: C

Explanation: The **tentorial notch** allows the **brainstem** to pass from supratentorial to infratentorial compartment.

Q178. The **pineal gland** is part of:

- A. Hypothalamus
- B. Midbrain
- C. Epithalamus
- D. Thalamus

Answer: C

Explanation: The **pineal gland** is part of the **epithalamus**, involved in melatonin secretion.

Q179. The **cauda equina** contains:

- A. Upper motor neuron fibers
- B. Lower motor neuron fibers
- C. Brainstem tracts
- D. Basal ganglia

Answer: B

Explanation: The **cauda equina** consists of **lower motor neuron fibers** of lumbar and sacral spinal nerves.

Q180. The **pituitary gland** is located in:

- A. Foramen magnum
- B. Tentorium cerebelli
- C. Sella turcica
- D. Ethmoid sinus

Answer: C

Explanation: The **pituitary gland** sits in the **sella turcica** of the sphenoid bone.

Q181. The **spinal accessory nerve** exits the skull via:

- A. Foramen magnum
- B. Jugular foramen
- C. Hypoglossal canal
- D. Stylomastoid foramen

Answer: B

Explanation: CN XI (accessory) exits via **jugular foramen**, after entering through foramen magnum.

Q182. The **cerebral aqueduct** connects:

- A. Lateral ventricles to third ventricle
- B. Third to fourth ventricle
- C. Fourth to central canal
- D. Cisterna magna to lateral ventricle

Answer: B

Explanation: The **cerebral aqueduct (of Sylvius)** connects **3rd and 4th ventricles**.

Q183. The **precentral gyrus** is responsible for:

- A. Sensory function
- B. Motor function
- C. Speech comprehension
- D. Visual interpretation

Answer: B

Explanation: The **precentral gyrus** is the **primary motor cortex**.

Q184. The **central sulcus** separates:

- A. Temporal and parietal lobes
- B. Frontal and temporal lobes
- C. Frontal and parietal lobes
- D. Occipital and temporal lobes

Answer: C

Explanation: The **central sulcus (Rolandic fissure)** separates **frontal** from **parietal lobe**.

Q185. The **parietal lobe** is primarily associated with:

- A. Vision
- B. Auditory function
- C. Somatosensory perception
- D. Language production

Answer: C

Explanation: The **parietal lobe** houses the **postcentral gyrus (primary somatosensory cortex)**.

Q186. The **cerebellum** controls:

- A. Conscious movement
- B. Involuntary reflexes
- C. Coordination and balance
- D. Emotional responses

Answer: C

Explanation: The **cerebellum** is essential for **motor coordination, balance, and posture**.

Q187. The **pons** is part of:

- A. Cerebrum
- B. Brainstem
- C. Cerebellum
- D. Diencephalon

Answer: B

Explanation: The **pons** lies between the midbrain and medulla and is part of the **brainstem**.

Q188. The **median nerve** passes between the heads of:

- A. Pronator teres
- B. Flexor carpi ulnaris
- C. Supinator
- D. Brachioradialis

Answer: A

Explanation: The **median nerve** passes between the **two heads of pronator teres** in the forearm.

Q189. The **ulnar nerve** enters the hand through:

- A. Carpal tunnel
- B. Anatomical snuffbox
- C. Guyon's canal
- D. Radial tunnel

Answer: C

Explanation: The **ulnar nerve** enters the hand through **Guyon's canal**, superficial to the flexor retinaculum.

Q190. The **lateral epicondyle** is the origin of:

- A. Flexor muscles
- B. Extensor muscles
- C. Supinator
- D. Pronator quadratus

Answer: B

Explanation: The **lateral epicondyle** is the common origin for **forearm extensors**.

Q191. The **thoracic duct** drains into the:

- A. Right subclavian vein
- B. Left subclavian vein
- C. Superior vena cava
- D. Azygos vein

Answer: B

Explanation: The **thoracic duct** drains into the **junction of left subclavian and internal jugular veins**.

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Q192. The **femoral sheath** contains all EXCEPT:

- A. Femoral artery
- B. Femoral vein
- C. Femoral nerve
- D. Lymphatics

Answer: C

Explanation: The **femoral nerve** lies **outside** the femoral sheath.

Q193. The **great saphenous vein** drains into:

- A. Popliteal vein
- B. Femoral vein
- C. External iliac vein
- D. Internal iliac vein

Answer: B

Explanation: The **great saphenous vein** drains into the **femoral vein** at the saphenous opening.

Q194. The **obturator nerve** innervates:

- A. Gluteal muscles
- B. Quadriceps
- C. Adductors
- D. Hamstrings

Answer: C

Explanation: The **obturator nerve** supplies the **adductor compartment** of the thigh.

Q195. The **radial nerve** is most commonly injured at:

- A. Surgical neck
- B. Spiral groove
- C. Elbow
- D. Wrist

Answer: B

Explanation: In midshaft humeral fractures, the **radial nerve** is injured in the **spiral groove**.

Q196. The **femoral triangle** is bounded medially by:

- A. Adductor magnus
- B. Pectineus
- C. Sartorius
- D. Adductor longus

Answer: D

Explanation: Adductor longus forms the **medial boundary** of the femoral triangle.

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Q197. The **middle meningeal artery** is a branch of:

- A. Facial artery
- B. Maxillary artery
- C. Internal carotid artery
- D. Posterior auricular artery

Answer: B

Explanation: **Middle meningeal artery** is a branch of **maxillary artery**, a terminal branch of external carotid.

Q198. The **trachea bifurcates** at what vertebral level?

- A. T2
- B. T4
- C. T6
- D. T8

Answer: B

Explanation: The **trachea** divides into **bronchi** at the level of the **sternal angle (T4)**.

Q199. The **cricothyroid membrane** is located between:

- A. Thyroid cartilage and hyoid
- B. Thyroid and cricoid cartilages
- C. Cricoid and trachea
- D. Hyoid and epiglottis

Answer: B

Explanation: The **cricothyroid membrane** connects the **thyroid** and **cricoid cartilages**.

Q200. **Erb's point** corresponds to which spinal roots?

- A. C5–C6
- B. C6–C7
- C. C7–C8
- D. C8–T1

Answer: A

Explanation: **Erb's point** involves C5

CARBOHYDRATE METABOLISM (Q1–15)

Q1. The end product of glycolysis under anaerobic conditions is:

- A. Acetyl-CoA
- B. Lactic acid
- C. Pyruvate
- D. Ethanol

Answer: B – Lactic acid

Explanation: In anaerobic conditions (e.g. muscle), **pyruvate is reduced to lactate** by lactate dehydrogenase.

Q2. Rate-limiting enzyme of glycolysis:

- A. Hexokinase
- B. Glucokinase
- C. Phosphofructokinase-1 (PFK-1)
- D. Pyruvate kinase

Answer: C – PFK-1

Explanation: **PFK-1** is the major control point of glycolysis, allosterically regulated.

Q3. Insulin increases activity of all EXCEPT:

- A. Hexokinase
- B. PFK-1
- C. Glucose-6-phosphatase
- D. Pyruvate kinase

Answer: C – Glucose-6-phosphatase

Explanation: Insulin **inhibits gluconeogenesis**; glucose-6-phosphatase is part of it.

Q4. Glycogen is stored primarily in:

- A. Brain and kidney
- B. Muscle and liver
- C. Pancreas and spleen
- D. RBCs and lung

Answer: B – Muscle and liver

Explanation: **Liver glycogen** maintains blood glucose; **muscle glycogen** for local energy use.

Q5. Rate-limiting enzyme of glycogenolysis:

- A. Glycogen phosphorylase
- B. Debranching enzyme
- C. Hexokinase
- D. Glucose-6-phosphatase

Answer: A – Glycogen phosphorylase

Explanation: It **cleaves α -1,4 glycosidic bonds** and releases glucose-1-phosphate.

Q6. Enzyme deficient in Von Gierke's disease:

- A. Glycogen phosphorylase
- B. Debranching enzyme
- C. Glucose-6-phosphatase
- D. Glucokinase

Answer: C – Glucose-6-phosphatase

Explanation: Leads to **severe fasting hypoglycemia** and **hepatomegaly**.

Q7. Cori cycle connects:

- A. Brain and liver

- B. Muscle and liver
- C. Muscle and kidney
- D. Liver and adipose

Answer: B – Muscle and liver

Explanation: Lactate from anaerobic muscle is converted to glucose in liver.

Q8. Main source of glucose during first 12 hrs of fasting:

- A. Gluconeogenesis
- B. Lipolysis
- C. Glycogenolysis
- D. Ketogenesis

Answer: C – Glycogenolysis

Explanation: Stored glycogen provides glucose during early fasting.

Q9. Pentose phosphate pathway produces:

- A. NADH
- B. FADH₂
- C. NADPH
- D. ATP

Answer: C – NADPH

Explanation: NADPH is required for reductive biosynthesis and antioxidant defense.

Q10. Hexokinase vs Glucokinase – which is insulin-inducible?

- A. Both
- B. Glucokinase
- C. Hexokinase
- D. Neither

Answer: B – Glucokinase

Explanation: Found in liver & β -cells, induced by insulin.

Q11. Substrate for gluconeogenesis:

- A. Acetyl-CoA
- B. Fatty acids
- C. Glycerol
- D. Leucine

Answer: C – Glycerol

Explanation: Glycerol, lactate, and glucogenic amino acids are substrates.

Q12. Which step in glycolysis generates ATP?

- A. Glucose $\rightarrow$ G6P
- B. PEP $\rightarrow$ Pyruvate
- C. F6P $\rightarrow$ F1,6BP
- D. Glucose $\rightarrow$ Fructose

Answer: B – PEP $\rightarrow$ Pyruvate

Explanation: Catalyzed by pyruvate kinase, produces 1 ATP per reaction.

Q13. Enzyme converting pyruvate to OAA:

- A. LDH
- B. Pyruvate carboxylase
- C. PEPCK
- D. Malate dehydrogenase

Answer: B – Pyruvate carboxylase

Explanation: Requires biotin, important for gluconeogenesis.

Q14. Essential coenzyme for pyruvate dehydrogenase complex:

- A. Biotin
- B. Cobalamin
- C. Thiamine
- D. Pyridoxine

Answer: C – Thiamine

Explanation: Pyruvate dehydrogenase requires **TPP (B1)**, lipoic acid, CoA, FAD, and NAD⁺.

Q15. Enzyme converting glucose to sorbitol:

- A. Sorbitol dehydrogenase
- B. Hexokinase
- C. Aldose reductase
- D. Alcohol dehydrogenase

Answer: C – Aldose reductase

Explanation: Accumulated **sorbitol** can damage retina, lens, nerves.

PROTEIN METABOLISM & ENZYMES (Q16–30)

Q16. Transamination requires which vitamin?

- A. B2
- B. B6
- C. B12
- D. Biotin

Answer: B – B6 (Pyridoxine)

Explanation: Transaminases use **PLP (pyridoxal phosphate)** as coenzyme.

Q17. Urea cycle occurs in:

- A. Kidney
- B. Liver
- C. Muscle
- D. Intestine

Answer: B – Liver

Explanation: Urea is synthesized in the liver to remove nitrogen.

Q18. Rate-limiting enzyme of urea cycle:

- A. Argininosuccinate lyase
- B. Carbamoyl phosphate synthetase I
- C. Ornithine transcarbamylase
- D. Arginase

Answer: B – CPS I

Explanation: Requires **N-acetylglutamate** as activator.

Q19. Maple syrup urine disease is due to defect in:

- A. Phenylalanine hydroxylase
- B. Branched-chain ketoacid dehydrogenase
- C. Homogentisic oxidase
- D. Cystathionine synthase

Answer: B – BCKD

Explanation: Accumulation of branched-chain AAs (Leu, Ile, Val) → neurologic signs.

Q20. Phenylketonuria (PKU) is due to deficiency of:

- A. Tyrosine
- B. Phenylalanine
- C. Phenylalanine hydroxylase
- D. Homogentisic acid

Answer: C – Phenylalanine hydroxylase

Explanation: Results in ↑ **phenylalanine**, ↓ tyrosine → mental retardation if untreated.

Q21. Enzyme kinetics: V_{max} increases in:

- A. Competitive inhibition
- B. Non-competitive inhibition
- C. Allosteric inhibition
- D. Substrate saturation

Answer: A – Competitive inhibition

Explanation: In **competitive inhibition**, V_{max} is **unchanged**, but K_m increases.

Q22. K_m in Michaelis–Menten indicates:

- A. Maximal enzyme velocity
- B. Enzyme quantity
- C. Substrate affinity
- D. Catalytic efficiency

Answer: C – Substrate affinity

Explanation: Lower K_m = **higher affinity** of enzyme for substrate.

Q23. Enzyme activity is measured by:

- A. K_m
- B. Coenzyme amount
- C. Product formed per unit time
- D. Substrate consumed

Answer: C – Product formed/unit time

Explanation: Enzyme activity = **rate of product formation**.

Q24. Cofactor for carbonic anhydrase:

- A. Mg^{2+}
- B. Fe^{2+}
- C. Zn^{2+}
- D. Cu^{2+}

Answer: C – Zinc

Explanation: **Zinc is essential** for carbonic anhydrase activity.

Q25. Allosteric enzymes show:

- A. Constant velocity
- B. Sigmoidal curve
- C. Michaelis–Menten kinetics
- D. Zero-order kinetics

Answer: B – Sigmoidal curve

Explanation: **Allosteric enzymes show cooperativity** → sigmoid kinetics.

Q26. Isoenzyme of LDH in heart:

- A. LDH1
- B. LDH2
- C. LDH3
- D. LDH5

Answer: A – LDH1

Explanation: LDH1 > LDH2 in MI, seen in flipped ratio.

Q27. Enzyme used for diagnosis of pancreatitis:

- A. LDH
- B. AST

C. Amylase

D. Creatine kinase

Answer: C – Amylase

Explanation: Amylase and lipase are elevated in acute pancreatitis.

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Q28. Inhibitor of cytochrome oxidase:

A. CO

B. Cyanide

C. Rotenone

D. Oligomycin

Answer: B – Cyanide

Explanation: Cyanide blocks Complex IV → inhibits ETC → tissue hypoxia.

Q29. First enzyme in heme synthesis:

A. ALA synthase

B. ALA dehydratase

C. Ferrochelatase

D. Porphobilinogen deaminase

Answer: A – ALA synthase

Explanation: Rate-limiting step, requires vitamin B6.

Q30. Enzyme elevated in myocardial infarction (MI):

A. Amylase

B. CK-MB

C. LDH5

D. AST only

Answer: B – CK-MB

Explanation: CK-MB rises in MI within 4–6 hrs, peaks at 24 hrs.

VITAMINS & COFACTORS (Q31–40)

Q31. Vitamin B1 (Thiamine) is required for:

A. Transamination

B. Glycolysis

C. Oxidative decarboxylation

D. Carboxylation

Answer: C – Oxidative decarboxylation

Explanation: Thiamine (TPP) is essential for enzymes like pyruvate dehydrogenase, α-KG dehydrogenase.

Q32. Deficiency of vitamin B12 causes all EXCEPT:

A. Megaloblastic anemia

B. Hypersegmented neutrophils

C. Peripheral neuropathy

D. Hemolytic anemia

Answer: D – Hemolytic anemia

Explanation: B12 deficiency → megaloblastic anemia + neurologic symptoms, not hemolysis.

Q33. Vitamin K is essential for:

A. Collagen synthesis

B. Coagulation factor activation

C. Neutrophil migration

D. TCA cycle

Answer: B – Coagulation factor activation

Explanation: Vitamin K γ-carboxylates factors II, VII, IX, X, protein C & S.

Q34. Pellagra is due to deficiency of:

- A. Riboflavin
- B. Thiamine
- C. Niacin
- D. Biotin

Answer: C – Niacin

Explanation: Niacin (B3) deficiency → **dermatitis, diarrhea, dementia**.

Q35. Biotin is required for:

- A. Deamination
- B. Carboxylation
- C. Phosphorylation
- D. Hydroxylation

Answer: B – Carboxylation

Explanation: Biotin is a **cofactor for carboxylase enzymes** (e.g., pyruvate → OAA).

Q36. Rickets is caused by deficiency of:

- A. Vitamin A
- B. Vitamin D
- C. Vitamin E
- D. Calcium

Answer: B – Vitamin D

Explanation: Vitamin D deficiency → **defective bone mineralization** in children.

Q37. Vitamin C is required for:

- A. Oxidative phosphorylation
- B. Glycogen synthesis
- C. Collagen hydroxylation
- D. Urea cycle

Answer: C – Collagen hydroxylation

Explanation: Vitamin C helps **hydroxylate proline/lysine** residues in collagen.

Q38. Which vitamin is a cofactor for transaminases?

- A. B1
- B. B2
- C. B6
- D. B12

Answer: C – B6 (Pyridoxine)

Explanation: PLP (active form of B6) is coenzyme for **aminotransferases**.

Q39. Deficiency of Vitamin A causes:

- A. Night blindness
- B. Rickets
- C. Bleeding
- D. Ataxia

Answer: A – Night blindness

Explanation: **11-cis-retinal** (from vitamin A) is critical for **vision**.

Q40. Vitamin associated with **neural tube defects**:

- A. B1
- B. B6
- C. B9 (Folate)
- D. B12

Answer: C – Folate

Explanation: Folate deficiency in early pregnancy → neural tube defects (e.g., spina bifida).

NUCLEIC ACIDS & MOLECULAR BIOLOGY (Q41–50)

Q41. DNA replication is:

- A. Conservative
- B. Dispersive
- C. Semi-conservative
- D. Random

Answer: C – Semi-conservative

Explanation: Each daughter DNA has **1 old strand + 1 new strand**.

Q42. RNA polymerase in eukaryotes for mRNA:

- A. RNA Pol I
- B. RNA Pol II
- C. RNA Pol III
- D. DNA Pol α

Answer: B – RNA Pol II

Explanation: RNA Pol II synthesizes **mRNA** (I = rRNA, III = tRNA).

Q43. Start codon in mRNA is:

- A. UAA
- B. AUG
- C. UAG
- D. UGA

Answer: B – AUG

Explanation: **AUG (Methionine)** is the universal **start codon**.

Q44. DNA damage by UV radiation primarily causes:

- A. DNA strand breaks
- B. Depurination
- C. Thymine dimers
- D. Deamination

Answer: C – Thymine dimers

Explanation: UV → **pyrimidine dimers**, especially T–T, repaired by **nucleotide excision repair**.

Q45. Enzyme that removes RNA primer during replication:

- A. DNA Pol I
- B. DNA Pol III
- C. Ligase
- D. Helicase

Answer: A – DNA Pol I

Explanation: **DNA Pol I** removes primers (5'→3' exonuclease) and fills gaps.

Q46. Direction of DNA synthesis:

- A. 5' → 5'
- B. 3' → 3'
- C. 3' → 5'
- D. 5' → 3'

Answer: D – 5' → 3'

Explanation: **DNA polymerase adds nucleotides to 3' end** → synthesis is 5' → 3'.

Q47. Splicing of introns occurs in:

- A. Ribosome

- B. Cytoplasm
- C. Nucleus
- D. Golgi

Answer: C – Nucleus

Explanation: Spliceosome removes introns from pre-mRNA in nucleus.

Q48. DNA polymerase requires:

- A. dNTPs
- B. RNA primer
- C. Template strand
- D. All of the above

Answer: D – All of the above

Explanation: DNA polymerase needs **template**, **dNTPs**, and **RNA primer** to start.

Q49. Enzyme joining Okazaki fragments:

- A. DNA Pol I
- B. DNA Pol III
- C. DNA ligase
- D. Primase

Answer: C – DNA ligase

Explanation: DNA ligase seals gaps between fragments on **lagging strand**.

Q50. Antioxidant enzyme containing selenium:

- A. Catalase
- B. Superoxide dismutase
- C. Glutathione peroxidase
- D. Glucose-6-phosphatase

Answer: C – Glutathione peroxidase

Explanation: Contains **selenocysteine**, neutralizes **peroxides**.

HORMONES & SIGNALING (Q51–60)

Q51. Hormone that acts via intracellular receptor:

- A. Glucagon
- B. Epinephrine
- C. Insulin
- D. Cortisol

Answer: D – Cortisol

Explanation: Steroid hormones like **cortisol** bind **nuclear receptors** and alter gene expression.

Q52. Second messenger for epinephrine (β -receptors):

- A. cGMP
- B. DAG
- C. cAMP
- D. IP_3

Answer: C – cAMP

Explanation: β -adrenergic signaling uses **cAMP** via **Gs protein**.

Q53. Insulin acts via:

- A. Tyrosine kinase receptor
- B. G-protein coupled receptor
- C. Intracellular receptor
- D. Adenylate cyclase

Answer: A – Tyrosine kinase receptor

Explanation: Insulin binds to its **receptor with intrinsic tyrosine kinase activity**.

Q54. cGMP is the second messenger for:

- A. Glucagon
- B. ANP
- C. TSH
- D. Vasopressin

Answer: B – ANP

Explanation: ANP and NO increase cGMP, leading to vasodilation.

Q55. IP₃ increases intracellular:

- A. Potassium
- B. Calcium
- C. Sodium
- D. Bicarbonate

Answer: B – Calcium

Explanation: IP₃ causes Ca²⁺ release from endoplasmic reticulum.

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Q56. Hormones using IP₃/DAG pathway:

- A. Insulin
- B. Glucagon
- C. ADH (V1)
- D. ADH (V2)

Answer: C – ADH (V1)

Explanation: ADH V1, oxytocin, and angiotensin II use IP₃/DAG signaling.

Q57. Hormone that increases glycogen breakdown in liver:

- A. Insulin
- B. Glucagon
- C. Somatostatin
- D. Growth hormone

Answer: B – Glucagon

Explanation: Glucagon activates glycogen phosphorylase via cAMP.

Q58. cAMP is degraded by:

- A. Adenylate cyclase
- B. Protein kinase A
- C. Guanylate cyclase
- D. Phosphodiesterase

Answer: D – Phosphodiesterase

Explanation: PDE breaks down cAMP → AMP.

Q59. Hormone increasing calcium absorption from gut:

- A. PTH
- B. Calcitonin
- C. Vitamin D
- D. Aldosterone

Answer: C – Vitamin D

Explanation: 1,25-dihydroxycholecalciferol (Vit D) enhances Ca²⁺ and phosphate absorption.

Q60. Second messenger for glucagon:

- A. IP₃
- B. cAMP
- C. Ca²⁺
- D. cGMP

Answer: B – cAMP

Explanation: Glucagon → Gs protein → adenylate cyclase → cAMP.

LIPIDS & CHOLESTEROL METABOLISM (Q61–75)

Q61. Essential fatty acid:

- A. Oleic acid
- B. Stearic acid
- C. Linoleic acid
- D. Palmitic acid

Answer: C – Linoleic acid

Explanation: Linoleic and α -linolenic acids are essential (not synthesized by humans).

Q62. First step of fatty acid synthesis:

- A. Acetyl-CoA carboxylation
- B. Fatty acyl CoA synthase
- C. Desaturation
- D. β -oxidation

Answer: A – Acetyl-CoA carboxylation

Explanation: Acetyl-CoA → malonyl-CoA via acetyl-CoA carboxylase (biotin-dependent).

Q63. Transport of fatty acids into mitochondria needs:

- A. Biotin
- B. Acetyl-CoA
- C. Carnitine
- D. NAD⁺

Answer: C – Carnitine

Explanation: Long-chain FAs use carnitine shuttle to enter mitochondria for β -oxidation.

Q64. β -oxidation occurs in:

- A. Cytosol
- B. Mitochondria
- C. Lysosome
- D. Peroxisome

Answer: B – Mitochondria

Explanation: Fatty acid breakdown (β -oxidation) occurs in mitochondria.

Q65. Lipoprotein that delivers cholesterol to tissues:

- A. HDL
- B. LDL
- C. VLDL
- D. Chylomicrons

Answer: B – LDL

Explanation: LDL = "bad cholesterol" – delivers cholesterol to peripheral cells.

Q66. Lipoprotein that removes cholesterol from tissues:

- A. HDL
- B. LDL
- C. IDL
- D. VLDL

Answer: A – HDL

Explanation: HDL = "good cholesterol" – carries cholesterol back to liver.

Q67. Enzyme activated by insulin in fat synthesis:

- A. HSL

B. Lipoprotein lipase

C. CPT I

D. Glucose-6-phosphatase

Answer: B – Lipoprotein lipase (LPL)

Explanation: LPL hydrolyzes TGs in lipoproteins for storage in adipocytes.

Q68. Rate-limiting enzyme of cholesterol synthesis:

A. HMG-CoA synthase

B. HMG-CoA reductase

C. Mevalonate kinase

D. Farnesyl transferase

Answer: B – HMG-CoA reductase

Explanation: Converts HMG-CoA → mevalonate. Target of statins.

Q69. Ketone body used for energy:

A. Acetone

B. Acetoacetate

C. Acetyl-CoA

D. Malonyl-CoA

Answer: B – Acetoacetate

Explanation: Acetoacetate and β -hydroxybutyrate are used for ATP in tissues.

Q70. Brain uses ketone bodies in:

A. Fed state

B. After protein-rich meal

C. Starvation (3–5 days)

D. During anaerobic glycolysis

Answer: C – Starvation (3–5 days)

Explanation: Brain uses ketones after prolonged fasting to spare glucose.

Q71. Enzyme deficient in Tay-Sachs disease:

A. Glucocerebrosidase

B. Hexosaminidase A

C. Sphingomyelinase

D. Galactocerebrosidase

Answer: B – Hexosaminidase A

Explanation: Causes accumulation of GM2 ganglioside, neurologic deterioration.

Q72. Enzyme deficient in Gaucher's disease:

A. α -galactosidase

B. Hexosaminidase

C. β -glucosidase

D. Sphingomyelinase

Answer: C – β -glucosidase (Glucocerebrosidase)

Explanation: Most common lysosomal storage disease, features hepatosplenomegaly, bone pain.

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Q73. ApoB-48 is found in:

A. HDL

B. Chylomicrons

C. VLDL

D. LDL

Answer: B – Chylomicrons

Explanation: ApoB-48 is required for intestinal lipid transport via chylomicrons.

Q74. Niemann–Pick disease involves deficiency of:

- A. Hexosaminidase A
- B. β -galactosidase
- C. Sphingomyelinase
- D. Galactocerebrosidase

Answer: C – Sphingomyelinase

Explanation: Accumulation of sphingomyelin in **CNS, liver, spleen**.

Q75. Lipid digestion begins in:

- A. Stomach
- B. Mouth
- C. Small intestine
- D. Colon

Answer: B – Mouth

Explanation: Lingual lipase initiates fat digestion.

METABOLIC INTEGRATION & MISCELLANEOUS (Q76–100)

Q76. Metabolic state during early fasting:

- A. Increased insulin
- B. Increased glycogenolysis
- C. Increased ketogenesis
- D. Increased protein synthesis

Answer: B – Increased glycogenolysis

Explanation: Glycogenolysis maintains blood glucose in the first 12–18 hours.

Q77. Muscle lacks:

- A. Glycogen
- B. Glucose–6–phosphatase
- C. Pyruvate kinase
- D. LDH

Answer: B – Glucose–6–phosphatase

Explanation: Muscle glycogen can't be released into blood due to **absence of G6Pase**.

Q78. Which tissues use only glucose under normal conditions?

- A. Heart
- B. Kidney
- C. RBCs
- D. Liver

Answer: C – RBCs

Explanation: RBCs have **no mitochondria** → only **anaerobic glycolysis**.

Q79. Organ that does not use ketone bodies:

- A. Brain
- B. Skeletal muscle
- C. Liver
- D. Kidney

Answer: C – Liver

Explanation: Liver **produces but does not utilize** ketone bodies.

Q80. First–line fuel in exercise (first few minutes):

- A. Glycogen
- B. Fatty acids
- C. Ketone bodies
- D. Protein

Answer: A – Glycogen

Explanation: Stored glycogen is the primary energy in early exercise.

Q81. Free radical scavenger:

- A. NADH
- B. Glutathione
- C. FAD
- D. Ubiquinone

Answer: B – Glutathione

Explanation: Glutathione peroxidase uses reduced glutathione (GSH) to neutralize peroxides.

Q82. Enzyme producing superoxide in neutrophils:

- A. Catalase
- B. NADPH oxidase
- C. Myeloperoxidase
- D. Superoxide dismutase

Answer: B – NADPH oxidase

Explanation: Catalyzes $O_2 \rightarrow O_2^-$ during respiratory burst.

Q83. Enzyme converting superoxide to H_2O_2 :

- A. Glutathione peroxidase
- B. Catalase
- C. Superoxide dismutase
- D. Peroxidase

Answer: C – Superoxide dismutase (SOD)

Explanation: Converts $O_2^- \rightarrow H_2O_2$, part of ROS defense.

Q84. Catalase acts on:

- A. Superoxide
- B. NADPH
- C. H_2O_2
- D. OH^-

Answer: C – H_2O_2

Explanation: Catalase decomposes hydrogen peroxide into water and O_2 .

Q85. Major antioxidant vitamin:

- A. Vitamin D
- B. Vitamin C
- C. Vitamin E
- D. Vitamin K

Answer: C – Vitamin E

Explanation: Vitamin E (α -tocopherol) protects lipid membranes from peroxidation.

Q86. Enzyme most heat-labile:

- A. LDH
- B. Alkaline phosphatase
- C. Amylase
- D. Lipase

Answer: B – Alkaline phosphatase

Explanation: ALP is used in heat stability tests to differentiate isoenzymes.

Q87. Diagnostic marker of hemolysis:

- A. ALT
- B. AST

C. LDH

D. CK

Answer: C – LDH

Explanation: LDH-1 increases in RBC lysis.

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Q88. Lab test for diabetes monitoring:

A. Fasting glucose

B. HbA1c

C. GTT

D. Serum insulin

Answer: B – HbA1c

Explanation: Reflects average blood glucose over 2–3 months.

Q89. Most specific test for MI:

A. AST

B. CK-MB

C. Troponin I

D. LDH

Answer: C – Troponin I

Explanation: Troponins are most sensitive and specific for MI.

Q90. Elevated in cholestasis:

A. ALT

B. AST

C. ALP

D. CK

Answer: C – ALP

Explanation: Alkaline phosphatase increases in biliary obstruction.

Q91. Urea is synthesized in:

A. Liver

B. Kidney

C. Muscle

D. Intestine

Answer: A – Liver

Explanation: Urea cycle occurs only in hepatocytes.

Q92. Marker of renal function:

A. Glucose

B. BUN

C. Albumin

D. AST

Answer: B – BUN (Blood Urea Nitrogen)

Explanation: BUN and creatinine assess renal excretory function.

Q93. Creatinine is derived from:

A. Glucose

B. Phosphocreatine

C. Tyrosine

D. Urea

Answer: B – Phosphocreatine

Explanation: Waste product of muscle creatine phosphate.

Q94. Best buffer in blood:

- A. HCO_3^-
- B. Phosphate
- C. Proteins
- D. NH_4^+

Answer: A – Bicarbonate

Explanation: Bicarbonate buffer system ($\text{HCO}_3^-/\text{H}_2\text{CO}_3$) is primary in plasma.

Q95. Anion gap increases in:

- A. Metabolic alkalosis
- B. Diarrhea
- C. Lactic acidosis
- D. Vomiting

Answer: C – Lactic acidosis

Explanation: Unmeasured anions (e.g., lactate) raise anion gap.

Q96. Alkaline urine favors excretion of:

- A. Weak acids
- B. Weak bases
- C. Proteins
- D. Water

Answer: A – Weak acids

Explanation: Ion trapping of acids occurs in alkaline urine.

Q97. Henderson–Hasselbalch equation relates:

- A. H^+ and protein
- B. pH, pKa, HCO_3^-
- C. PO_2 and pCO_2
- D. pH and glucose

Answer: B – pH, pKa, HCO_3^-

Explanation: Used to calculate blood pH from buffer systems.

Q98. Main buffer inside RBCs:

- A. Hemoglobin
- B. Bicarbonate
- C. Phosphate
- D. Urea

Answer: A – Hemoglobin

Explanation: Deoxyhemoglobin buffers H^+ produced by carbonic anhydrase.

Q99. In acidosis, potassium shifts:

- A. Into cells
- B. Out of cells
- C. No change
- D. Into urine

Answer: B – Out of cells

Explanation: H^+ enters cells during acidosis → K^+ exits to maintain charge.

Q100. Primary source of ammonia for urea synthesis:

- A. Tyrosine
- B. Glutamine
- C. Phenylalanine
- D. Tryptophan

Answer: B – Glutamine

Explanation: Glutamine donates NH_3 to the urea cycle.

MOLECULAR BIOLOGY & BIOTECHNOLOGY (Q101–115)

Q101. Technique used to amplify DNA:

- A. Western blot
- B. ELISA
- C. PCR
- D. Southern blot

Answer: C – PCR

Explanation: Polymerase Chain Reaction exponentially amplifies DNA sequences.

Q102. Southern blot is used to detect:

- A. RNA
- B. DNA
- C. Protein
- D. Lipid

Answer: B – DNA

Explanation: Southern = DNA, Northern = RNA, Western = Protein.

Q103. DNA sequencing method used traditionally:

- A. ELISA
- B. Sanger method
- C. RIA
- D. Blotting

Answer: B – Sanger method

Explanation: Involves dideoxynucleotides to terminate DNA elongation at specific bases.

Q104. Restriction enzymes cut DNA at:

- A. Random sites
- B. Ribosome
- C. Specific sequences
- D. Telomeres

Answer: C – Specific sequences

Explanation: Recognize palindromic sequences and generate sticky or blunt ends.

Q105. Probe-based hybridization is used in:

- A. Centrifugation
- B. PCR
- C. Southern blot
- D. Chromatography

Answer: C – Southern blot

Explanation: A DNA probe hybridizes with specific complementary DNA fragments.

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Q106. DNA electrophoresis separates fragments by:

- A. Charge only
- B. Size only
- C. Size and charge
- D. Density

Answer: B – Size only

Explanation: Agarose gel electrophoresis separates DNA by fragment size.

Q107. Enzyme used in PCR:

- A. DNA ligase
- B. Taq polymerase

C. DNA helicase

D. DNA polymerase α

Answer: B – Taq polymerase

Explanation: Thermostable enzyme from *Thermus aquaticus*, tolerates high temperatures.

Q108. Gene expression measurement technique:

A. Southern blot

B. Northern blot

C. Western blot

D. ELISA

Answer: B – Northern blot

Explanation: Northern blot detects mRNA, hence measures gene expression.

Q109. Real-time PCR detects:

A. Protein folding

B. RNA viruses

C. Real-time blood glucose

D. Urinary enzymes

Answer: B – RNA viruses

Explanation: RT-PCR (reverse transcription PCR) is used to detect RNA viruses like COVID-19.

Q110. Genetic code is all EXCEPT:

A. Triplet

B. Universal

C. Ambiguous

D. Degenerate

Answer: C – Ambiguous

Explanation: Genetic code is unambiguous—each codon codes only one amino acid.

Q111. Anticodon is present on:

A. mRNA

B. tRNA

C. rRNA

D. DNA

Answer: B – tRNA

Explanation: Anticodon of tRNA pairs with codon of mRNA during translation.

Q112. Initiation codon in translation is:

A. UAA

B. UGA

C. AUG

D. UAG

Answer: C – AUG

Explanation: Codes for methionine, initiates protein synthesis.

Q113. Site of protein synthesis:

A. Nucleus

B. Ribosome

C. Golgi body

D. Mitochondria

Answer: B – Ribosome

Explanation: Ribosomes translate mRNA to protein in cytoplasm or RER.

Q114. Post-translational modification occurs in:

A. Golgi apparatus

B. Lysosome

C. Nucleus

D. Ribosome

Answer: A – Golgi apparatus

Explanation: Glycosylation, sulfation, sorting all occur in Golgi.

Q115. Protein separation by size:

A. Northern blot

B. Southern blot

C. SDS-PAGE

D. Column chromatography

Answer: C – SDS-PAGE

Explanation: SDS-PAGE denatures proteins and separates based on molecular weight.

ACID-BASE BALANCE & METABOLIC DISORDERS (Q116–130)

Q116. Acidosis with high anion gap:

A. Vomiting

B. Diarrhea

C. Lactic acidosis

D. Renal tubular acidosis

Answer: C – Lactic acidosis

Explanation: Unmeasured anions like lactate, ketones raise anion gap.

Q117. Normal anion gap is:

A. 5–10

B. 8–12

C. 15–20

D. 20–25

Answer: B – 8–12 mEq/L

Explanation: Calculated as $\text{Na}^+ - (\text{Cl}^- + \text{HCO}_3^-)$.

Q118. Respiratory acidosis is due to:

A. Hyperventilation

B. Increased bicarbonate

C. CO_2 retention

D. Metabolic acid gain

Answer: C – CO_2 retention

Explanation: Seen in COPD, hypoventilation $\rightarrow \uparrow \text{pCO}_2$.

Q119. Cause of metabolic alkalosis:

A. Diarrhea

B. DKA

C. Vomiting

D. Renal failure

Answer: C – Vomiting

Explanation: Loss of H^+ (gastric acid) $\rightarrow$ metabolic alkalosis.

Q120. High urea with normal creatinine suggests:

A. Glomerular failure

B. Pre-renal azotemia

C. Liver failure

D. Nephrotic syndrome

Answer: B – Pre-renal azotemia

Explanation: Dehydration/hypoperfusion → ↑ **urea reabsorption**, normal creatinine.

Q121. Hyperammonemia is seen in:

- A. Hemolysis
- B. Liver failure
- C. Uremia
- D. Addison's disease

Answer: B – Liver failure

Explanation: Liver fails to convert ammonia to urea → encephalopathy.

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Q122. Maple syrup urine disease involves accumulation of:

- A. Phenylalanine
- B. Homocysteine
- C. Branched-chain AAs
- D. Methionine

Answer: C – Branched-chain AAs

Explanation: Leucine, isoleucine, valine accumulate due to **BCKD deficiency**.

Q123. Alkaptonuria is due to deficiency of:

- A. Tyrosinase
- B. Homogentisic oxidase
- C. Phenylalanine hydroxylase
- D. Fumarylacetoacetate hydrolase

Answer: B – Homogentisic oxidase

Explanation: Causes **dark urine**, arthritis due to homogentisic acid.

Q124. Phenylketonuria presents with:

- A. Ketotic hypoglycemia
- B. Musty odor
- C. Hepatomegaly
- D. Cataracts

Answer: B – Musty odor

Explanation: Accumulated phenylalanine metabolites cause **mousy/musty body odor**.

Q125. Defect in cystinuria:

- A. Tyrosine absorption
- B. Cystine reabsorption
- C. Ornithine synthesis
- D. Arginase activity

Answer: B – Cystine reabsorption

Explanation: Leads to **cystine kidney stones** due to defective **PCT transporter**.

Q126. Lesch-Nyhan syndrome is due to:

- A. ADA deficiency
- B. HGPRT deficiency
- C. UMP synthase deficiency
- D. G6PD deficiency

Answer: B – HGPRT deficiency

Explanation: Causes **uric acid buildup**, self-mutilation, mental retardation.

Q127. Gout is associated with:

- A. Hypouricemia
- B. Hypoglycemia

C. Hyperuricemia

D. Hypercalcemia

Answer: C – Hyperuricemia

Explanation: Deposition of **monosodium urate crystals** in joints.

Q128. Type 1 diabetes shows:

A. Insulin resistance

B. Obesity

C. Autoimmune β -cell destruction

D. Hypoglycemia

Answer: C – Autoimmune β -cell destruction

Explanation: Type 1 DM is **insulin-dependent**, autoimmune in nature.

Q129. Main ketone body found in blood:

A. Acetone

B. Acetoacetate

C. β -Hydroxybutyrate

D. Acetyl-CoA

Answer: C – β -Hydroxybutyrate

Explanation: Most abundant **ketone body** in blood, especially in DKA.

Q130. Enzyme deficiency in galactosemia:

A. Galactokinase

B. Galactose epimerase

C. GALT

D. Aldolase B

Answer: C – GALT

Explanation: Classic galactosemia due to **galactose-1-P uridyltransferase** deficiency.

METABOLIC CYCLES & CLINICAL LINKS (Q131–150)

Q131. First step of TCA cycle:

A. Pyruvate $\rightarrow$ Acetyl-CoA

B. Acetyl-CoA + OAA $\rightarrow$ Citrate

C. Isocitrate $\rightarrow$ α -KG

D. Succinyl-CoA $\rightarrow$ Succinate

Answer: B – Acetyl-CoA + OAA $\rightarrow$ Citrate

Explanation: Catalyzed by **citrate synthase**.

Q132. TCA cycle occurs in:

A. Cytosol

B. Mitochondria

C. Nucleus

D. Golgi

Answer: B – Mitochondria

Explanation: All TCA enzymes except **fumarase** are **mitochondrial**.

Q133. Inhibitor of ATP synthase:

A. Cyanide

B. Oligomycin

C. Rotenone

D. Antimycin A

Answer: B – Oligomycin

Explanation: Oligomycin blocks **proton channel** of ATP synthase (Complex V).

Q134. Substrate-level phosphorylation in TCA cycle:

- A. Citrate → Isocitrate
- B. α -KG → Succinyl-CoA
- C. Succinyl-CoA → Succinate
- D. Malate → OAA

Answer: C – Succinyl-CoA → Succinate

Explanation: GTP is formed in this step via succinyl-CoA synthetase.

Q135. Vitamin required by α -KG dehydrogenase:

- A. Thiamine
- B. Pyridoxine
- C. Cobalamin
- D. Biotin

Answer: A – Thiamine

Explanation: Requires TPP, like pyruvate dehydrogenase.

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Q136. NADPH used in all EXCEPT:

- A. Fatty acid synthesis
- B. Cholesterol synthesis
- C. Gluconeogenesis
- D. Glutathione reduction

Answer: C – Gluconeogenesis

Explanation: NADPH is not needed in gluconeogenesis; used in reductive biosynthesis.

Q137. Enzyme converting citrate to isocitrate:

- A. Citrate synthase
- B. Aconitase
- C. Isocitrate dehydrogenase
- D. Succinyl-CoA synthetase

Answer: B – Aconitase

Explanation: Aconitase rearranges citrate to isocitrate.

Q138. Major product of pentose phosphate pathway:

- A. ATP
- B. NADPH
- C. FADH_2
- D. NADH

Answer: B – NADPH

Explanation: Used in fatty acid synthesis, detox, glutathione regeneration.

Q139. First enzyme in glycolysis:

- A. Glucokinase
- B. Phosphofructokinase
- C. Pyruvate kinase
- D. Hexokinase

Answer: D – Hexokinase

Explanation: Phosphorylates glucose to G6P.

Q140. Site of urea cycle:

- A. Cytosol only
- B. Mitochondria only
- C. Cytosol and mitochondria
- D. Nucleus

Answer: C – Cytosol and mitochondria

Explanation: CPS1 is mitochondrial; remaining steps in **cytosol**.

Q141. Ammonia detoxification occurs primarily via:

- A. Aspartate
- B. Glutamine
- C. Lysine
- D. Alanine

Answer: B – Glutamine

Explanation: Glutamine safely transports NH_3 to liver/kidney.

Q142. Tryptophan is a precursor for:

- A. Epinephrine
- B. Serotonin
- C. Dopamine
- D. Melatonin

Answer: B – Serotonin

Explanation: Tryptophan $\rightarrow$ 5-HT (serotonin) $\rightarrow$ melatonin

Q143. Dopamine is synthesized from:

- A. Tyrosine
- B. Phenylalanine
- C. Histidine
- D. Tryptophan

Answer: A – Tyrosine

Explanation: Tyrosine $\rightarrow$ DOPA $\rightarrow$ dopamine $\rightarrow$ NE $\rightarrow$ EPI

Q144. Histamine is derived from:

- A. Histidine
- B. Tyrosine
- C. Tryptophan
- D. Methionine

Answer: A – Histidine

Explanation: Decarboxylation of histidine via PLP-dependent enzyme.

Q145. Glutathione contains all EXCEPT:

- A. Cysteine
- B. Glutamate
- C. Glycine
- D. Arginine

Answer: D – Arginine

Explanation: GSH = Glu + Cys + Gly

Q146. Enzyme responsible for fructose metabolism in liver:

- A. Aldolase A
- B. Hexokinase
- C. Fructokinase
- D. Galactokinase

Answer: C – Fructokinase

Explanation: Converts fructose $\rightarrow$ fructose-1-P

Q147. Rate-limiting step in gluconeogenesis:

- A. Pyruvate kinase
- B. Pyruvate carboxylase
- C. PEPCK

D. Glucose-6-phosphatase

Answer: B – Pyruvate carboxylase

Explanation: Converts pyruvate to **OAA** in mitochondria (biotin-dependent).

Q148. Essential amino acid:

- A. Serine
- B. Glycine
- C. Leucine
- D. Cysteine

Answer: C – Leucine

Explanation: Essential AAs must be obtained from diet.

Q149. Glycogen synthesis primer is:

- A. Glycogen synthase
- B. UDP-glucose
- C. Glycogenin
- D. Glucokinase

Answer: C – Glycogenin

Explanation: **Glycogenin** starts glycogen chain before glycogen synthase takes over.

Q150. Substrate for gluconeogenesis NOT used:

- A. Glycerol
- B. Lactate
- C. Acetyl-CoA
- D. Alanine

Answer: C – Acetyl-CoA

Explanation: **Acetyl-CoA** cannot be converted to glucose.

NUCLEOTIDE METABOLISM (Q151–160)

Q151. Purine bases are synthesized from all EXCEPT:

- A. Glycine
- B. Aspartate
- C. Glutamine
- D. Tyrosine

Answer: D – Tyrosine

Explanation: Purines derive from **glycine, aspartate, glutamine, CO₂, and tetrahydrofolate.**

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Q152. Rate-limiting enzyme of purine synthesis:

- A. HGPRT
- B. Adenosine deaminase
- C. PRPP amidotransferase
- D. Carbamoyl phosphate synthetase II

Answer: C – PRPP amidotransferase

Explanation: Regulates **de novo purine synthesis**; inhibited by AMP, GMP, IMP.

Q153. Uric acid is the end product of:

- A. Protein catabolism
- B. Fatty acid oxidation
- C. Purine metabolism
- D. Pyrimidine metabolism

Answer: C – Purine metabolism

Explanation: Purines → hypoxanthine → xanthine → **uric acid.**

Q154. Pyrimidine synthesis requires:

- A. Glutamine, aspartate, CO₂
- B. Glycine, folate
- C. Tyrosine, serine
- D. Phenylalanine, arginine

Answer: A – Glutamine, aspartate, CO₂

Explanation: These form the **pyrimidine ring**, unlike purines which build base on sugar.

Q155. All are pyrimidine bases EXCEPT:

- A. Cytosine
- B. Uracil
- C. Thymine
- D. Guanine

Answer: D – Guanine

Explanation: Guanine is a **purine**, others are **pyrimidines**.

Q156. Enzyme deficient in SCID (severe combined immunodeficiency):

- A. ADA (adenosine deaminase)
- B. HGPRT
- C. PRPP synthetase
- D. Xanthine oxidase

Answer: A – ADA

Explanation: **ADA deficiency** → toxic deoxyadenosine buildup → lymphocyte apoptosis.

Q157. Lesch–Nyhan syndrome shows:

- A. Hyperuricemia
- B. Self-mutilation
- C. Neurological delay
- D. All of the above

Answer: D – All of the above

Explanation: Caused by **HGPRT deficiency** → uric acid overproduction + CNS effects.

Q158. Drug inhibiting xanthine oxidase:

- A. Allopurinol
- B. Methotrexate
- C. 5-FU
- D. Azathioprine

Answer: A – Allopurinol

Explanation: **Allopurinol** inhibits **xanthine oxidase**, reducing uric acid formation in gout.

Q159. 5-fluorouracil (5-FU) inhibits:

- A. Dihydrofolate reductase
- B. Thymidylate synthase
- C. Xanthine oxidase
- D. Adenosine deaminase

Answer: B – Thymidylate synthase

Explanation: Prevents conversion of **dUMP** → **dTMP**, blocking DNA synthesis.

Q160. Methotrexate inhibits:

- A. PRPP synthetase
- B. Dihydrofolate reductase
- C. HGPRT
- D. Ribonucleotide reductase

Answer: B – Dihydrofolate reductase

Explanation: MTX is a **folate analog** used in cancer therapy.

HEME, PORPHYRINS & RELATED DISORDERS (Q161–170)

Q161. First enzyme in heme synthesis:

- A. ALA synthase
- B. Ferrochelatase
- C. Porphobilinogen deaminase
- D. ALA dehydratase

Answer: A – ALA synthase

Explanation: Rate-limiting enzyme, requires **vitamin B6** (pyridoxal phosphate).

Q162. Lead poisoning inhibits:

- A. ALA synthase and ferrochelatase
- B. ALA dehydratase and ferrochelatase
- C. Porphobilinogen synthase only
- D. None of the above

Answer: B – ALA dehydratase and ferrochelatase

Explanation: Causes **microcytic anemia** and $\uparrow$ ALA.

Q163. Acute intermittent porphyria is due to deficiency of:

- A. Uroporphyrinogen III cosynthase
- B. Ferrochelatase
- C. Porphobilinogen deaminase
- D. ALA synthase

Answer: C – Porphobilinogen deaminase

Explanation: Leads to accumulation of **porphobilinogen, ALA** $\rightarrow$ abdominal pain, neuro symptoms.

Q164. Porphyria cutanea tarda causes:

- A. Acute neuro symptoms
- B. Photosensitivity
- C. No symptoms
- D. Coma

Answer: B – Photosensitivity

Explanation: Uroporphyrinogen decarboxylase deficiency $\rightarrow$ blistering skin lesions.

Q165. Final product of heme degradation:

- A. Biliverdin
- B. Urobilinogen
- C. Stercobilin
- D. Bilirubin

Answer: D – Bilirubin

Explanation: Heme $\rightarrow$ biliverdin $\rightarrow$ bilirubin, then excreted in bile.

Q166. Jaundice with increased unconjugated bilirubin:

- A. Obstructive
- B. Hepatocellular
- C. Hemolytic
- D. Neonatal

Answer: C – Hemolytic

Explanation: Excess RBC breakdown $\rightarrow \uparrow$ **unconjugated (indirect) bilirubin**.

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Q167. Enzyme deficient in Crigler-Najjar syndrome:

- A. Glucuronyl transferase
- B. Urobilinogen synthase
- C. ALA synthase

D. Ferrochelatase

Answer: A – Glucuronyl transferase

Explanation: Prevents conjugation of bilirubin → ↑ indirect bilirubin.

Q168. Gilbert's syndrome is due to:

- A. Total enzyme absence
- B. Partial deficiency of UGT
- C. Iron deficiency
- D. Urobilinogen defect

Answer: B – Partial deficiency of UGT

Explanation: Mild unconjugated hyperbilirubinemia, benign, often asymptomatic.

Q169. Which form of bilirubin is water-soluble?

- A. Unconjugated
- B. Indirect
- C. Conjugated
- D. Bound bilirubin

Answer: C – Conjugated

Explanation: Conjugated (direct) bilirubin is glucuronidated and water-soluble.

Q170. Urine color in obstructive jaundice:

- A. Colorless
- B. Dark
- C. Normal
- D. Red

Answer: B – Dark

Explanation: Conjugated bilirubin spills into urine, giving dark color.

DETOX, LABS, ENZYME MARKERS (Q171–185)

Q171. Detoxification occurs mainly in:

- A. Kidney
- B. Liver
- C. Intestine
- D. Lung

Answer: B – Liver

Explanation: Phase I and II detox enzyme systems operate in hepatocytes.

Q172. Microsomal enzyme system includes:

- A. Alcohol dehydrogenase
- B. Cytochrome P450
- C. Catalase
- D. Peroxidase

Answer: B – Cytochrome P450

Explanation: CYP enzymes metabolize drugs, hormones, toxins.

Q173. Enzyme increased in prostate cancer:

- A. ALP
- B. PSA
- C. LDH
- D. AST

Answer: B – PSA

Explanation: Prostate-specific antigen rises in cancer and inflammation.

Q174. Alkaline phosphatase rises in:

- A. MI
- B. Muscle damage
- C. Bone disorders
- D. Hemolysis

Answer: C – Bone disorders

Explanation: Bone isoenzyme of ALP increases in Paget's disease, rickets.

Q175. Enzyme elevated in muscular dystrophy:

- A. CK-MM
- B. CK-MB
- C. LDH
- D. ALP

Answer: A – CK-MM

Explanation: Creatine kinase (muscle isoform) is elevated in muscle breakdown.

Q176. Most sensitive test for MI:

- A. LDH
- B. Troponin I
- C. CK-MB
- D. AST

Answer: B – Troponin I

Explanation: Troponin I rises early, stays elevated longer, highly specific.

Q177. Marker for pancreatic damage:

- A. LDH
- B. AST
- C. Amylase & Lipase
- D. CK-MB

Answer: C – Amylase & Lipase

Explanation: Lipase is more specific for pancreatic pathology.

Q178. LDH isoenzyme most abundant in heart:

- A. LDH1
- B. LDH2
- C. LDH3
- D. LDH5

Answer: A – LDH1

Explanation: LDH1 > LDH2 in MI, known as flipped ratio.

Q179. Enzyme used to monitor liver function:

- A. Creatinine kinase
- B. ALT/AST
- C. Amylase
- D. Urease

Answer: B – ALT/AST

Explanation: Transaminases indicate hepatocellular injury.

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Q180. Elevated GGT with high ALP suggests:

- A. Bone disease
- B. Cholestasis
- C. Hemolysis
- D. Muscle damage

Answer: B – Cholestasis

Explanation: GGT + ALP = hepatobiliary origin.

CLINICAL & CASE-BASED BIOCHEMISTRY (Q181–200)

Q181. Neonate with vomiting, jaundice, cataracts on milk feeding likely has:

- A. Lactose intolerance
- B. Classic galactosemia
- C. Maple syrup urine disease
- D. Homocystinuria

Answer: B – Galactosemia

Explanation: Deficiency of GALT, treat with lactose-free diet.

Q182. Child with lens dislocation, intellectual disability, thromboembolism:

- A. Marfan syndrome
- B. Homocystinuria
- C. Alkaptonuria
- D. Phenylketonuria

Answer: B – Homocystinuria

Explanation: Defect in cystathionine synthase, ↑ homocysteine.

Q183. Sweet-smelling urine, neurologic delay, ketoacidosis:

- A. MSUD
- B. Galactosemia
- C. PKU
- D. Alkaptonuria

Answer: A – Maple syrup urine disease

Explanation: Branched-chain ketoaciduria due to BCKD deficiency.

Q184. Albinism results from lack of:

- A. Melanin
- B. Tyrosinase
- C. Tyrosine
- D. Phenylalanine

Answer: B – Tyrosinase

Explanation: Prevents conversion of tyrosine to melanin.

Q185. Tall male, gynecomastia, small testes:

- A. Down syndrome
- B. Turner syndrome
- C. Klinefelter syndrome
- D. Fragile X

Answer: C – Klinefelter syndrome

Explanation: XXY karyotype, ↑ FSH/LH, ↓ testosterone.

Q186. Fructosuria is due to deficiency of:

- A. Fructokinase
- B. Aldolase B
- C. Galactokinase
- D. Glucokinase

Answer: A – Fructokinase

Explanation: Benign condition with fructose in urine.

Q187. Hereditary fructose intolerance due to defect in:

- A. Fructokinase
- B. Aldolase B
- C. GALT

D. UDP-glucuronyl transferase

Answer: B – Aldolase B

Explanation: Leads to hypoglycemia, vomiting, hepatomegaly.

Q188. Lipid profile is best done:

A. Post-meal

B. After exercise

C. Fasting

D. Anytime

Answer: C – Fasting

Explanation: Fasting avoids post-prandial lipid elevation.

Q189. Glycated hemoglobin reflects glucose over:

A. 1 week

B. 2 weeks

C. 6–8 weeks

D. 1 year

Answer: C – 6–8 weeks

Explanation: RBC lifespan ~120 days; HbA1c reflects 8–12 week average.

Q190. Best initial test in suspected diabetes:

A. HbA1c

B. Fasting glucose

C. Urine ketones

D. Insulin levels

Answer: B – Fasting glucose

Explanation: Standard screening and diagnostic test.

Q191. Serum amylase is normal but lipase elevated in:

A. Alcoholic hepatitis

B. Pancreatic pseudocyst

C. Viral hepatitis

D. Pregnancy

Answer: B – Pancreatic pseudocyst

Explanation: Lipase is more sensitive and remains elevated longer.

Q192. DNA damage by UV light causes:

A. Thymine dimers

B. RNA mutations

C. Cytosine methylation

D. Nucleotide mismatch

Answer: A – Thymine dimers

Explanation: Repaired by nucleotide excision repair.

Q193. DNA polymerase adds nucleotides:

A. 3' → 5'

B. Randomly

C. 5' → 3'

D. Both directions

Answer: C – 5' → 3'

Explanation: Adds nucleotides to the 3' OH end.

Q194. DNA ligase joins fragments by forming:

A. Hydrogen bonds

B. Phosphodiester bonds

C. Ionic bonds

D. Glycosidic bonds

Answer: B – Phosphodiester bonds

Explanation: Seals Okazaki fragments on lagging strand.

Q195. Reverse transcriptase synthesizes:

A. RNA from RNA

B. DNA from RNA

C. Protein from DNA

D. Protein from RNA

Answer: B – DNA from RNA

Explanation: Used in RT-PCR, retroviruses.

Q196. DNA mutation in sickle cell anemia:

A. Frameshift

B. Nonsense

C. Missense

D. Silent

Answer: C – Missense

Explanation: Valine replaces glutamic acid in β -globin chain.

Q197. tRNA binds to mRNA at:

A. Anticodon loop

B. D-loop

C. T ψ C loop

D. 5' cap

Answer: A – Anticodon loop

Explanation: tRNA anticodon pairs with mRNA codon during translation.

Q198. RNA splicing removes:

A. Exons

B. Promoters

C. Introns

D. Poly-A tails

Answer: C – Introns

Explanation: Exons expressed, introns interrupted.

Q199. Telomerase is a type of:

A. DNA polymerase

B. RNA polymerase

C. Reverse transcriptase

D. Endonuclease

Answer: C – Reverse transcriptase

Explanation: Adds TTAGGG repeats to chromosome ends.

Q200. UV damage is repaired by:

A. Base excision repair

B. Mismatch repair

C. Nucleotide excision repair

D. Homologous recombination

Answer: C – Nucleotide excision repair

Explanation: Removes bulky pyrimidine dimers, defective in xeroderma pigmentosum.

Q1. The rule that deals with criminal responsibility of an insane person is:

- A. Durham Rule
- B. McNaughten Rule
- C. Substantial Capacity Test
- D. ALI Rule

Correct Answer: B. McNaughten Rule

Explanation: McNaughten Rule states that a person is not responsible if, due to mental illness, they did not understand the nature or wrongfulness of the act.

Q2. A dying declaration is admissible under:

- A. Section 302 IPC
- B. Section 32 Indian Evidence Act
- C. Section 174 CrPC
- D. Section 197 IPC

Correct Answer: B. Section 32 Indian Evidence Act

Explanation: It allows statements made by a person on the verge of death to be accepted as evidence.

Q3. The most reliable sign of death is:

- A. Algor mortis
- B. Livor mortis
- C. Rigor mortis
- D. Cessation of circulation

Correct Answer: D. Cessation of circulation

Explanation: Permanent stoppage of circulation is the surest sign of death.

Q4. The term 'lucid interval' is most commonly used in:

- A. Epilepsy
- B. Post-concussion syndrome
- C. Extradural hemorrhage
- D. Hypoglycemia

Correct Answer: C. Extradural hemorrhage

Explanation: Characteristic feature: brief recovery of consciousness before rapid deterioration.

Q5. Which of the following is an example of grievous hurt?

- A. Simple fracture
- B. Tooth loss
- C. Contusion
- D. Black eye

Correct Answer: B. Tooth loss

Explanation: Loss of tooth is considered grievous under Section 320 IPC.

Q6. The most common fingerprint pattern is:

- A. Loop
- B. Whorl
- C. Arch
- D. Composite

Correct Answer: A. Loop

Explanation: Loop patterns are found in approximately 60–65% of the population.

Q7. The method used to visualize old or faint tattoos:

- A. Infrared photography
- B. Ultraviolet light

C. Magnifying glass

D. Luminol spray

Correct Answer: B. Ultraviolet light

Explanation: UV light highlights faded pigment not visible under normal light.

Q8. Suspended animation is best seen in:

A. Heat stroke

B. Alcohol poisoning

C. Drowning

D. Electrocution

Correct Answer: C. Drowning

Explanation: Breathing and pulse may be imperceptible, mimicking death.

Q9. The poison causing risus sardonicus is:

A. Strychnine

B. Curare

C. Aconite

D. Carbon monoxide

Correct Answer: A. Strychnine

Explanation: Strychnine causes convulsions and facial muscle spasm leading to sardonic grin.

Q10. Legal age for valid marriage for a girl in Pakistan is:

A. 16 years

B. 18 years

C. 20 years

D. 21 years

Correct Answer: A. 16 years

Explanation: Under Pakistani law, the minimum legal age is 16 for females (may vary by province).

Q11. The most reliable method of identifying a person is:

A. Scars

B. Birthmarks

C. Fingerprints

D. Tattoo marks

Correct Answer: C. Fingerprints

Explanation: Fingerprint patterns are unique and unchanged throughout life.

Q12. The postmortem lividity in CO poisoning is:

A. Bluish-purple

B. Cherry red

C. Green

D. Brown

Correct Answer: B. Cherry red

Explanation: Due to carboxyhemoglobin formation, giving skin and mucosa a pink-red hue.

Q13. A child born dead is termed:

A. Stillborn

B. Dead born

C. Premature

D. Non-viable

Correct Answer: A. Stillborn

Explanation: A fetus born after 20 weeks of gestation showing no signs of life.

Q14. Which test is used for detection of blood stains?

- A. Benzidine test
- B. Teichmann's test
- C. Kastle-Meyer test
- D. All of the above

Correct Answer: D. All of the above

Explanation: All are chemical tests to detect hemoglobin in forensic samples.

Q15. Which of the following burns is postmortem in origin?

- A. Blisters with albuminous fluid
- B. Heat hematoma
- C. Line of redness
- D. Soot in airways

Correct Answer: B. Heat hematoma

Explanation: Occurs when body is burnt after death; resembles extradural hemorrhage.

Q16. Which is an indication of antemortem hanging?

- A. Salivary dribbling
- B. No petechiae
- C. White ligature mark
- D. Fixed rigor mortis

Correct Answer: A. Salivary dribbling

Explanation: Considered a reliable sign of vital reaction in hanging.

Q17. Privileged communication refers to:

- A. Personal communication
- B. Public notice
- C. Protected information shared by a patient
- D. Government classified data

Correct Answer: C. Protected information shared by a patient

Explanation: Shared in confidence with medical professionals; not to be disclosed.

Q18. Magnan's symptom is seen in poisoning with:

- A. Cocaine
- B. Opium
- C. Cannabis
- D. LSD

Correct Answer: A. Cocaine

Explanation: Illusory sensation of insects crawling over skin—classic in cocaine abuse.

Q19. Which of the following marks are commonly seen in lightning injury?

- A. Lichtenberg figures
- B. Electrical burns
- C. Charring
- D. Blisters

Correct Answer: A. Lichtenberg figures

Explanation: Fern-like patterns unique to lightning strikes due to vascular rupture.

Q20. The "Rule of Hasse" is used to determine:

- A. Age from height
- B. Age from dentition
- C. Age of fetus from length
- D. Age from ossification centers

Correct Answer: C. Age of fetus from length

Explanation: Hasse's Rule = Length of fetus in cm $\approx$ (Month)² in 1st half; x5 in 2nd half.

Q21. The spinal cord is examined in autopsy by:

- A. Posterior approach
- B. Anterior approach
- C. Lateral approach
- D. Base of skull

Correct Answer: A. Posterior approach

Explanation: Involves removal of vertebral arches after reflection of back skin and muscles.

Q22. Pugilistic attitude is caused by:

- A. Antemortem burns
- B. Rigor mortis
- C. Heat coagulation of muscles
- D. Postmortem lividity

Correct Answer: C. Heat coagulation of muscles

Explanation: Seen in severely burnt bodies due to muscle shrinkage from heat.

Q23. Which poison gives a garlic odor on breath?

- A. Arsenic
- B. Cyanide
- C. Organophosphates
- D. Aluminium phosphide

Correct Answer: D. Aluminium phosphide

Explanation: Garlic-like odor is characteristic of phosphine gas from ALP poisoning.

Q24. A laceration over a bony prominence with regular margins can mimic:

- A. Abrasion
- B. Incised wound
- C. Contusion
- D. Stab wound

Correct Answer: B. Incised wound

Explanation: Called an incised-looking laceration; due to skin splitting over bone.

Q25. The appearance of rigor mortis in facial muscles begins:

- A. 1–2 hours after death
- B. 6–8 hours after death
- C. 12–18 hours after death
- D. 24 hours after death

Correct Answer: A. 1–2 hours after death

Explanation: Begins in small muscles (eyelids, jaw) and progresses downwards.

Q26. The best indicator of recent sexual intercourse is:

- A. Presence of pubic hair
- B. Spermatozoa on vaginal swab
- C. Ruptured hymen
- D. Seminal stains on clothing

Correct Answer: B. Spermatozoa on vaginal swab

Explanation: Microscopic identification of motile sperm within 6 hours confirms recent intercourse.

Q27. Widmark formula is used to estimate:

- A. Body temperature
- B. Age of fetus
- C. Time of death
- D. Blood alcohol concentration

Correct Answer: D. Blood alcohol concentration

Explanation: Widmark formula helps calculate alcohol concentration based on body weight and alcohol consumed.

Q28. Gunpowder tattooing is seen in:

- A. Entry wound of contact shot
- B. Exit wound
- C. Distant firearm injury
- D. Close-range firearm injury

Correct Answer: D. Close-range firearm injury

Explanation: Unburnt gunpowder particles embed in skin producing blackened or tattooed appearance.

Q29. Marbling of the body is first seen in:

- A. 1–2 hours
- B. 6–8 hours
- C. 12–18 hours
- D. 36–48 hours

Correct Answer: C. 12–18 hours

Explanation: Greenish discoloration along veins appears as putrefaction progresses.

Q30. The color of postmortem hypostasis in phosphorus poisoning is:

- A. Bluish-purple
- B. Chocolate brown
- C. Greenish
- D. Dark brown

Correct Answer: C. Greenish

Explanation: Due to decomposition and formation of phosphorus-related pigments.

Q31. Legal responsibility in a case of drunken driving is determined by:

- A. Police report
- B. Blood alcohol level
- C. Medical officer's note
- D. Driver's confession

Correct Answer: B. Blood alcohol level

Explanation: A blood alcohol concentration ≥ 80 mg/dL is considered intoxicated under law.

Q32. The court which deals with inquests into unnatural deaths is:

- A. Civil court
- B. Sessions court
- C. Magistrate court
- D. Family court

Correct Answer: C. Magistrate court

Explanation: Magistrates conduct inquests for deaths in custody, suspicious deaths, etc.

Q33. The phenomenon where a dead body floats after sinking is called:

- A. Adipocere formation
- B. Putrefaction
- C. Secondary rise
- D. Gas bloating

Correct Answer: C. Secondary rise

Explanation: After initial sinking, gas formation causes the body to rise to surface.

Q34. True statement regarding cadaveric spasm:

- A. Occurs hours after death

B. Involves all muscles

C. Occurs only in voluntary muscles

D. Is a feature of organophosphorus poisoning only

Correct Answer: C. Occurs only in voluntary muscles

Explanation: Seen in muscles in use at time of sudden death (e.g., clenched fists, weapons held).

Q35. Chromosomal sex is best identified by:

A. Blood group typing

B. Pelvic measurement

C. Buccal smear

D. Karyotyping

Correct Answer: D. Karyotyping

Explanation: Direct visualization of chromosomes confirms genetic sex (XX or XY).

Q36. Best site to check temperature in a dead body:

A. Oral cavity

B. Axilla

C. Rectum

D. Groin

Correct Answer: C. Rectum

Explanation: Rectal temperature remains accurate and stable after death.

Q37. Rigor mortis disappears completely in:

A. 6–8 hours

B. 12–24 hours

C. 24–36 hours

D. 48–72 hours

Correct Answer: C. 24–36 hours

Explanation: It starts within 1–2 hours and lasts for up to 36 hours under normal conditions.

Q38. The most specific test for blood detection is:

A. Kastle–Meyer test

B. Benzidine test

C. Precipitin test

D. Takayama test

Correct Answer: D. Takayama test

Explanation: Takayama test is a microcrystal confirmatory test specific for hemoglobin.

Q39. Which of the following is a sign of death due to strangulation?

A. Clean-cut ligature mark

B. Fracture of hyoid bone

C. Salivary dribbling

D. Facial pallor

Correct Answer: B. Fracture of hyoid bone

Explanation: Classical finding in manual strangulation especially in older adults.

Q40. Which term refers to death within 24 hours of injury without regaining consciousness?

A. Natural death

B. Apparent death

C. Coma

D. Sudden death

Correct Answer: C. Coma

Explanation: Coma-type death involves brain damage; patient never regains consciousness.

Q41. The pattern of lividity in a hanging victim is usually:

- A. Generalized
- B. Present above the ligature
- C. Present below the ligature
- D. Absent in hanging

Correct Answer: C. Present below the ligature

Explanation: Due to gravity, livor mortis settles in dependent parts below the noose.

Q42. Medical negligence resulting in death is charged under:

- A. Section 304 IPC
- B. Section 299 IPC
- C. Section 304A IPC
- D. Section 302 IPC

Correct Answer: C. Section 304A IPC

Explanation: Deals with death due to rash or negligent act.

Q43. The criminal responsibility of a child below 7 years is:

- A. 50%
- B. 25%
- C. Full
- D. Nil

Correct Answer: D. Nil

Explanation: Under Section 82 IPC, children <7 years are presumed incapable of criminal intent.

Q44. The sign that confirms live birth in an infant is:

- A. Caput succedaneum
- B. Maceration
- C. Air in stomach and intestines
- D. Meconium in colon

Correct Answer: C. Air in stomach and intestines

Explanation: Indicates respiration and swallowing → proof of live birth.

Q45. The term "burking" refers to:

- A. Strangulation and smothering
- B. Poisoning and shooting
- C. Hanging and drowning
- D. Burning and electrocution

Correct Answer: A. Strangulation and smothering

Explanation: A homicidal method used historically to kill victims without visible signs.

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Q46. McNab's test is used for:

- A. Diatoms in drowning
- B. Alcohol levels
- C. Brain death diagnosis
- D. Detection of sperm

Correct Answer: A. Diatoms in drowning

Explanation: Presence of diatoms in bone marrow confirms antemortem drowning.

Q47. "Pugilistic attitude" indicates:

- A. Drowning
- B. Poisoning
- C. Thermal injury
- D. Hanging

Correct Answer: C. Thermal injury

Explanation: Flexed posture from heat-induced muscle contraction in burn victims.

Q48. Medical certificate of cause of death is issued under:

- A. CrPC 174
- B. Births and Deaths Registration Act
- C. Evidence Act
- D. Section 304 IPC

Correct Answer: B. Births and Deaths Registration Act

Explanation: Required for official death registration and legal documentation.

Q49. A poison that smells like bitter almonds is:

- A. Arsenic
- B. Cyanide
- C. Strychnine
- D. Opium

Correct Answer: B. Cyanide

Explanation: Hydrogen cyanide gives a characteristic bitter almond odor.

Q50. Mental illness which affects legal responsibility must impair:

- A. Reason only
- B. Memory only
- C. Judgment only
- D. Reasoning, memory, and judgment

Correct Answer: D. Reasoning, memory, and judgment

Explanation: According to M'Naughten Rule, all faculties must be affected to avoid responsibility.

